

Agenda 4iii: Looking Forward

Tropical Cyclones: Monthly/Seasonal Outlooks for April 2024 to October 2024

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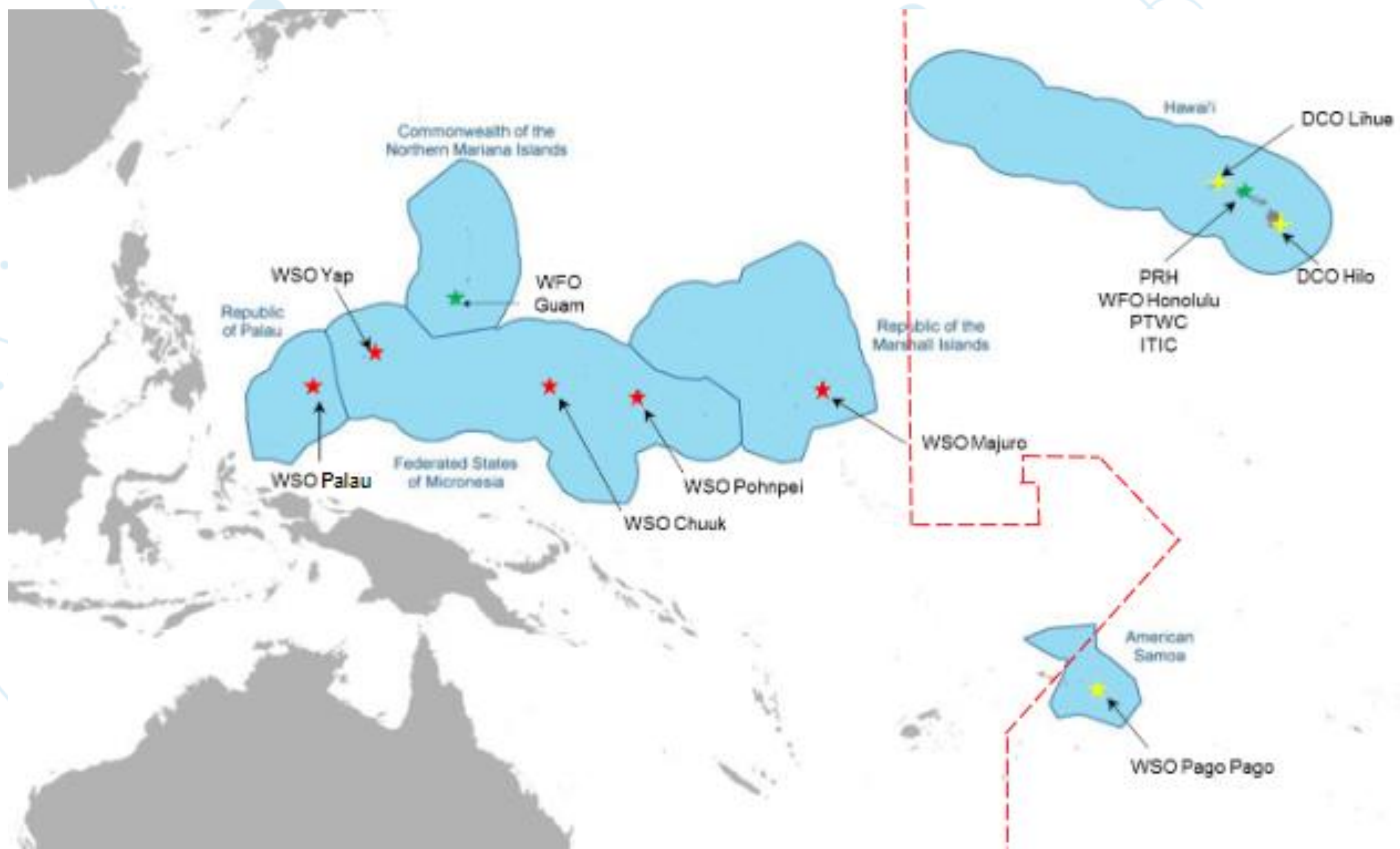
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Outline of Presentation

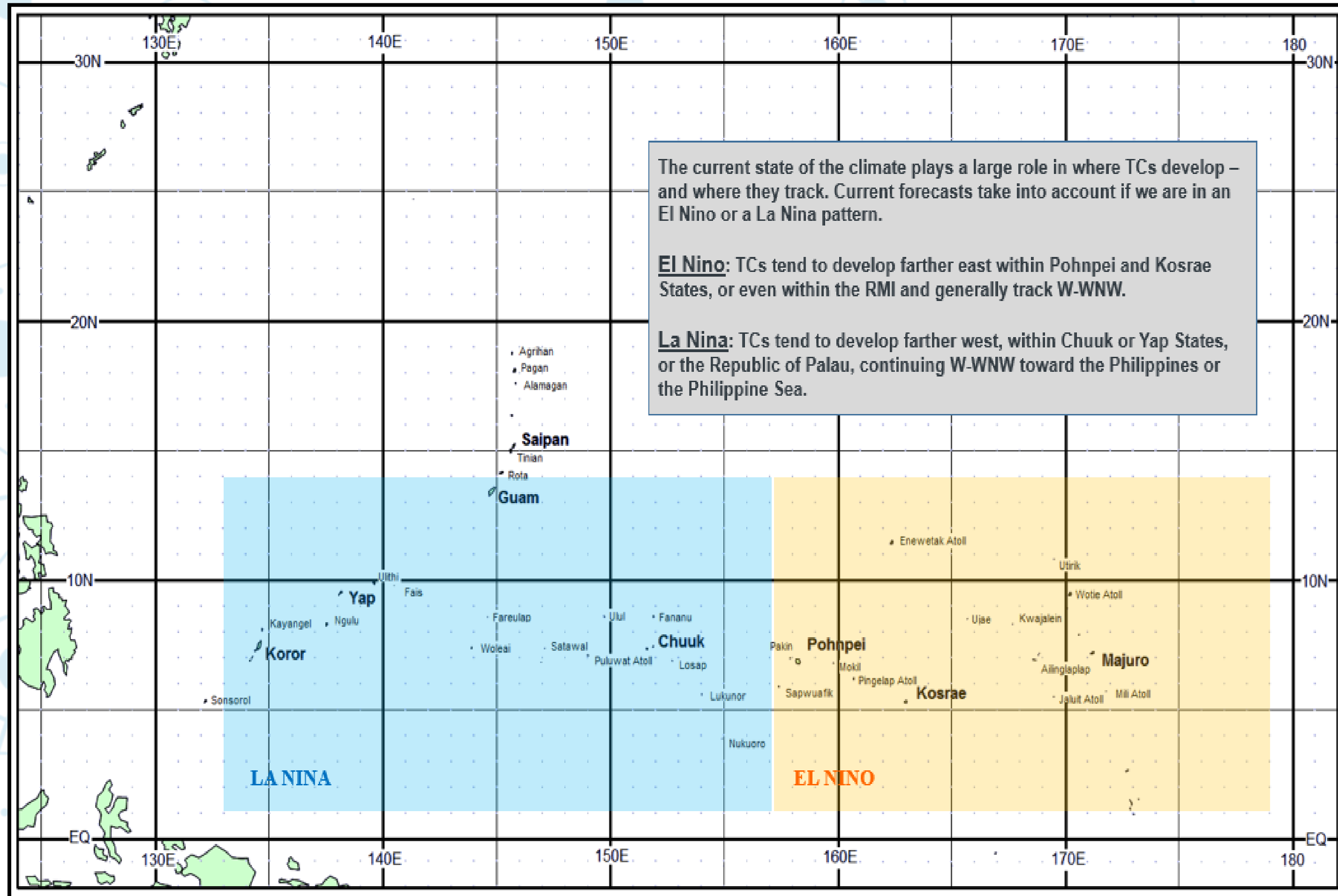
- **WFO Guam and NWS Pacific Region**
- **Traditional TC Genesis Zones during ENSO phases**
- **Quick Summary of the 2023 North Pacific TC Season**
- **2024 Western North Pacific (WNP) and Central North Pacific (CNP) Preliminary Outlook**



Map of the U.S. National Weather Service (NWS) Pacific Region and the Weather Forecast Office (WFO) Guam Area of Responsibility (AOR)

Source: National Weather Service, Pacific Region

Location of tropical cyclone genesis can fluctuate significantly from year to year based on the current state of the climate



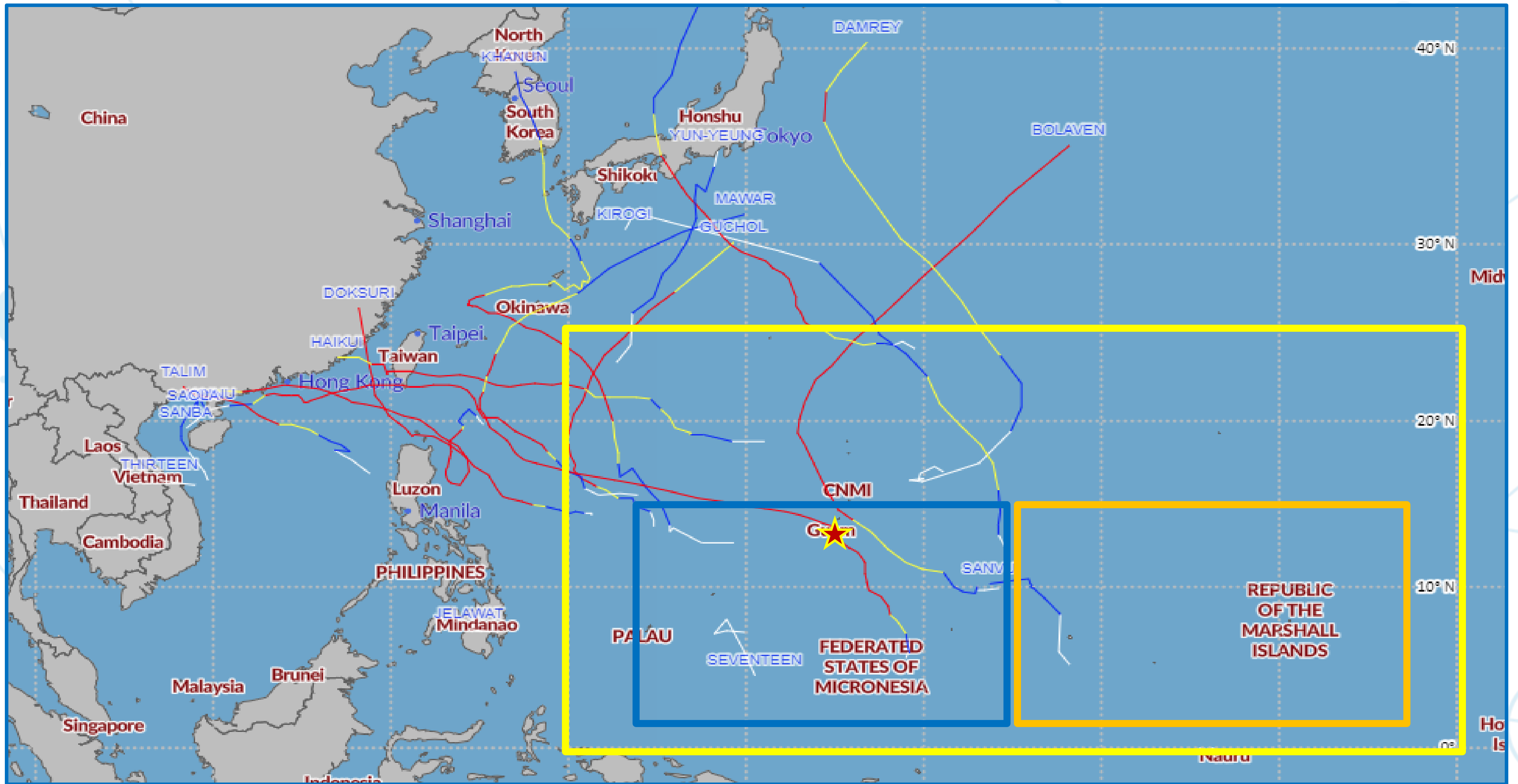
Summary of 2023 WNP TC Season

- El Niño onset year following the 3-peat La Niña (2020, 2021, 2022)

Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2020	0.5	0.5	0.4	0.2	-0.1	-0.3	-0.4	-0.6	-0.9	-1.2	-1.3	-1.2
2021	-1.0	-0.9	-0.8	-0.7	-0.5	-0.4	-0.4	-0.5	-0.7	-0.8	-1.0	-1.0
2022	-1.0	-0.9	-1.0	-1.1	-1.0	-0.9	-0.8	-0.9	-1.0	-1.0	-0.9	-0.8
2023	-0.7	-0.4	-0.1	0.2	0.5	0.8	1.1	1.3	1.6	1.8	1.9	2.0

Source: Climate Prediction Center

- TC Pattern unconventional for an El Niño onset year (distribution and overall typhoon count)
- Despite overall oddities of an El Niño onset year, Typhoon Mawar ravaged Guam and Typhoon Bolaven swept through the CNMI



2023 Western North Pacific Tropical Cyclones

Source: WFO Guam

Typhoon Mawar (May 2023)

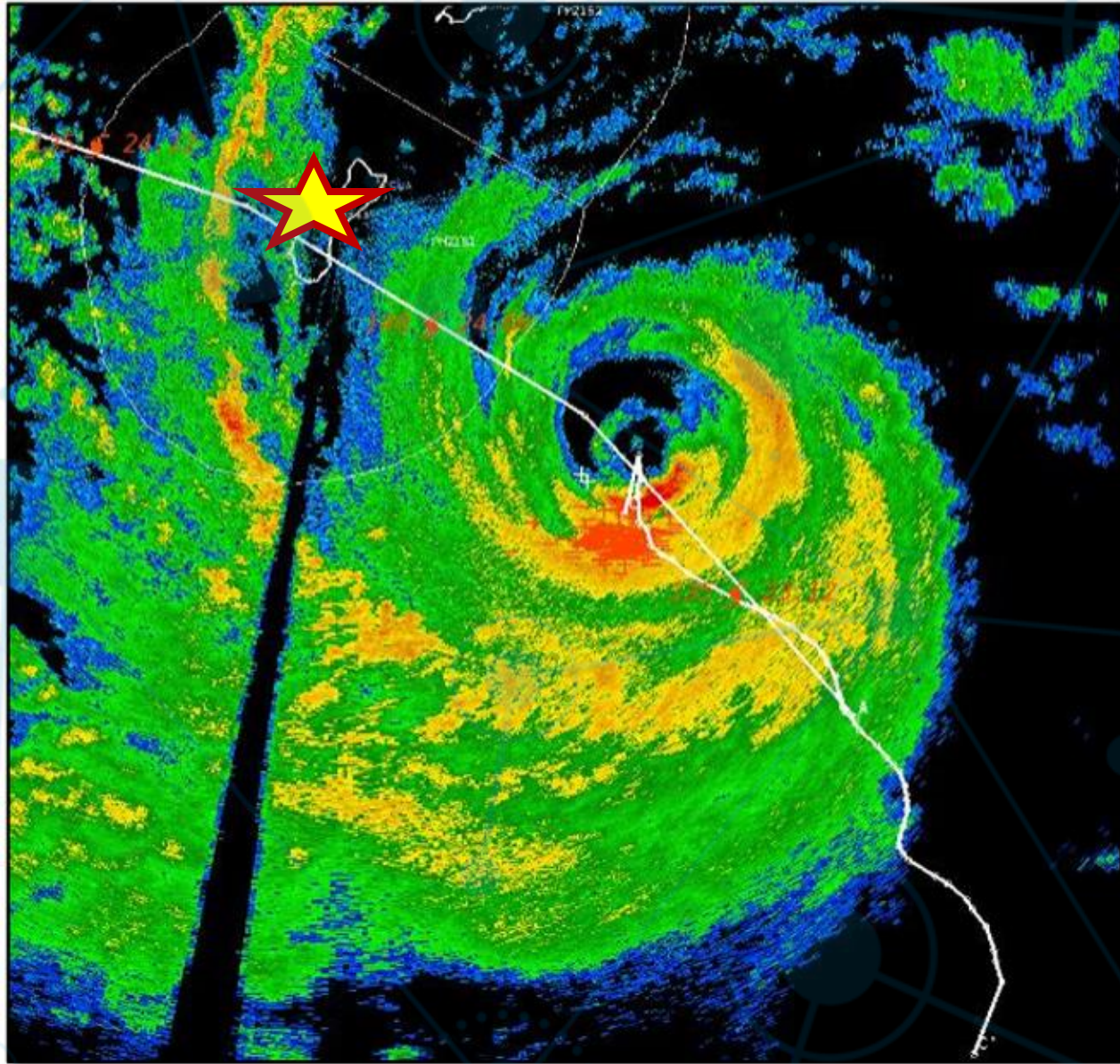


Figure 13: Andersen AFB WSR-88D image of TY Mawar as it approached Guam. The slightly-arcing white line shows JTWC's latest forecast track; the curvy white line shows the actual path of Mawar's eye.

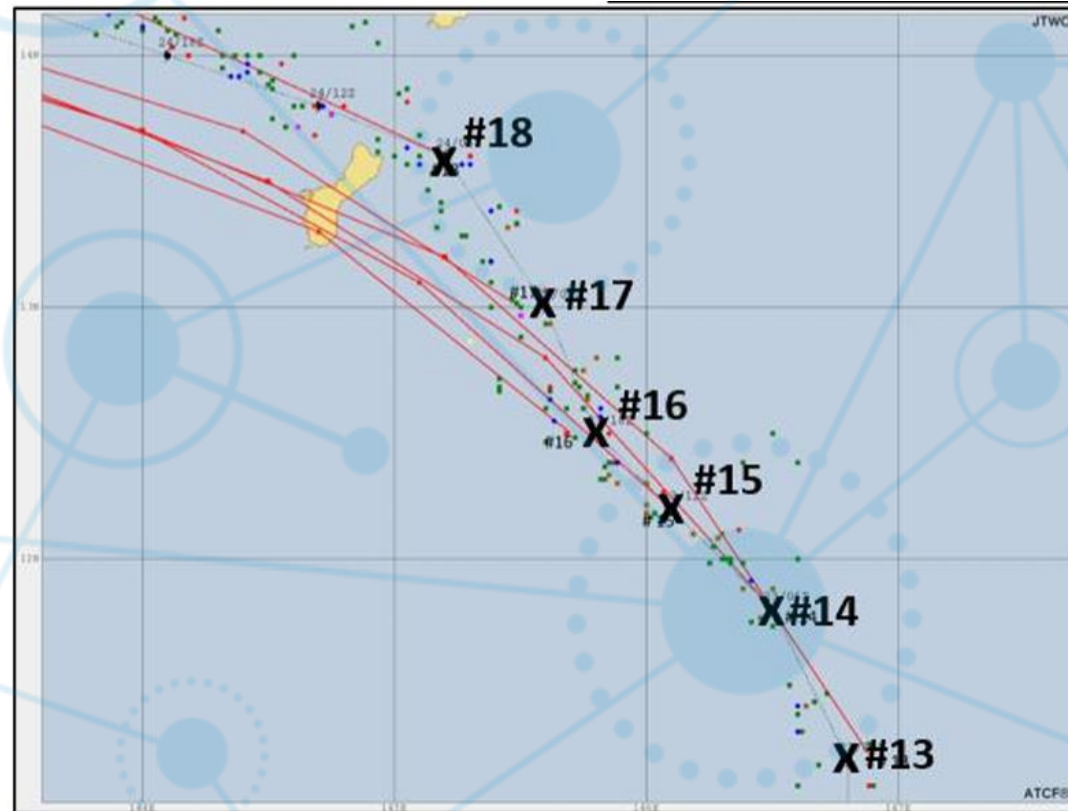


Figure 12: A composite of 6-hourly JTWC warning positions and forecast tracks, satellite fixes, and hourly radar position estimates. Courtesy, JTWC.

Mawar was eerily similar to Typhoon Pamela (1976)

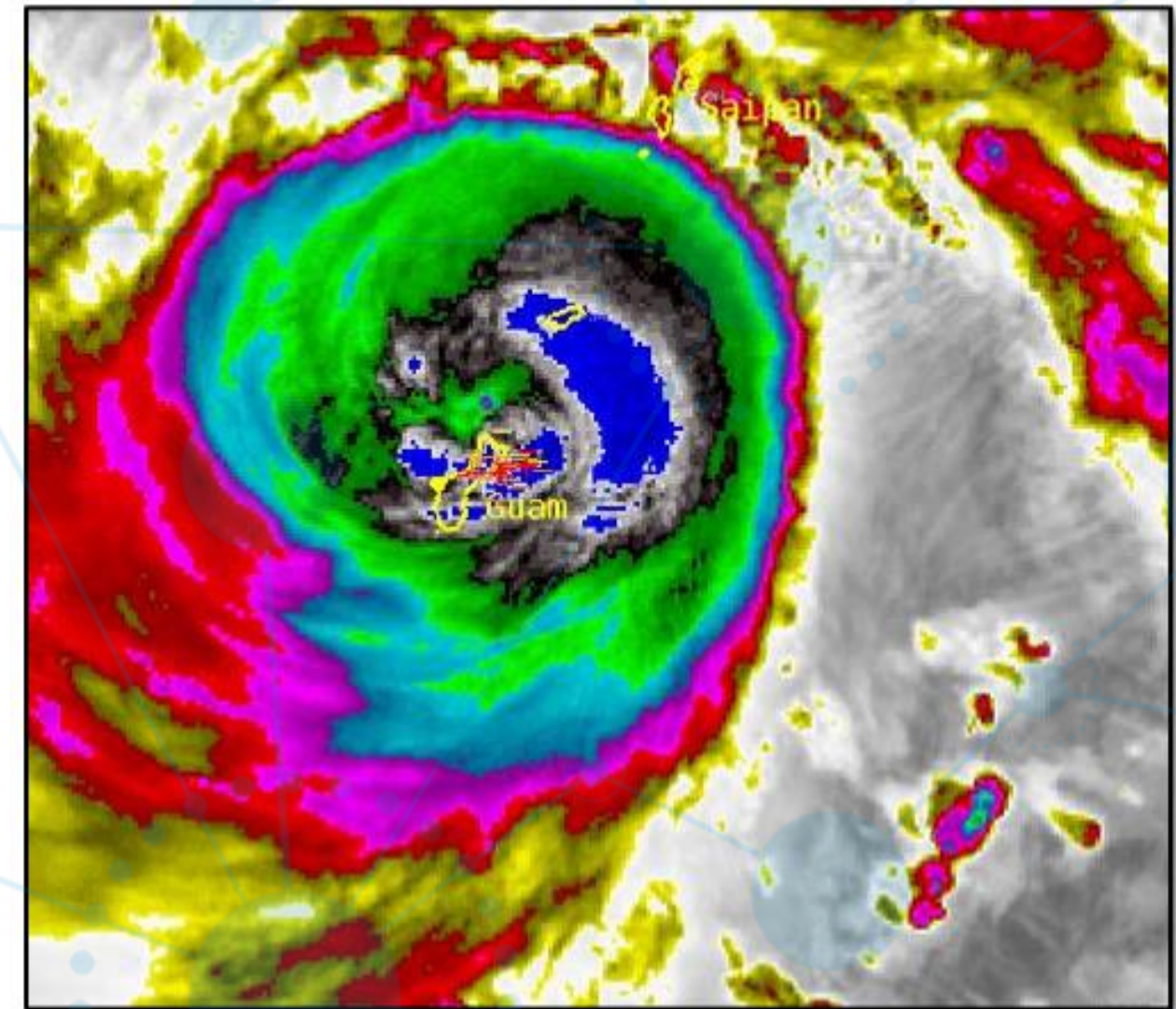
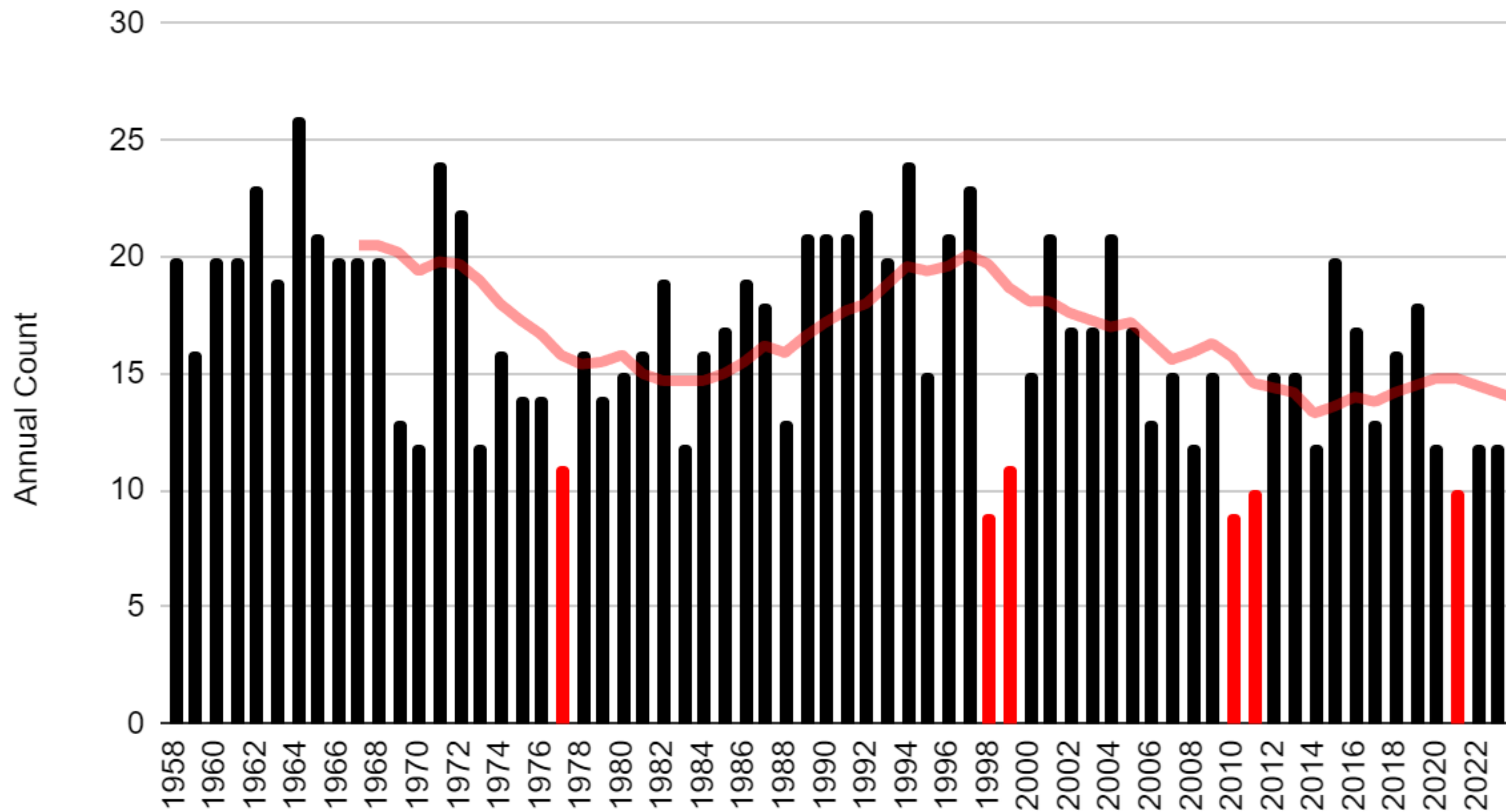


Figure 23: Himawari-9 10.41um "Clean IR" imagery from 24May/0959Z (7:59 PM ChST) depicting the cloud-filled eye of Mawar passing near Ritidian, Guam, while intense eyewall convection envelops the island. Red crosses indicate lightning detected by Vaisala's GLD360.

https://www.weather.gov/media/gum/TropicalEventSummary/20230905_NWS_Guam_STY_Mawar_Meteorological_Assessment.pdf

JTWC Annual Count of Typhoons (11 or fewer in red)

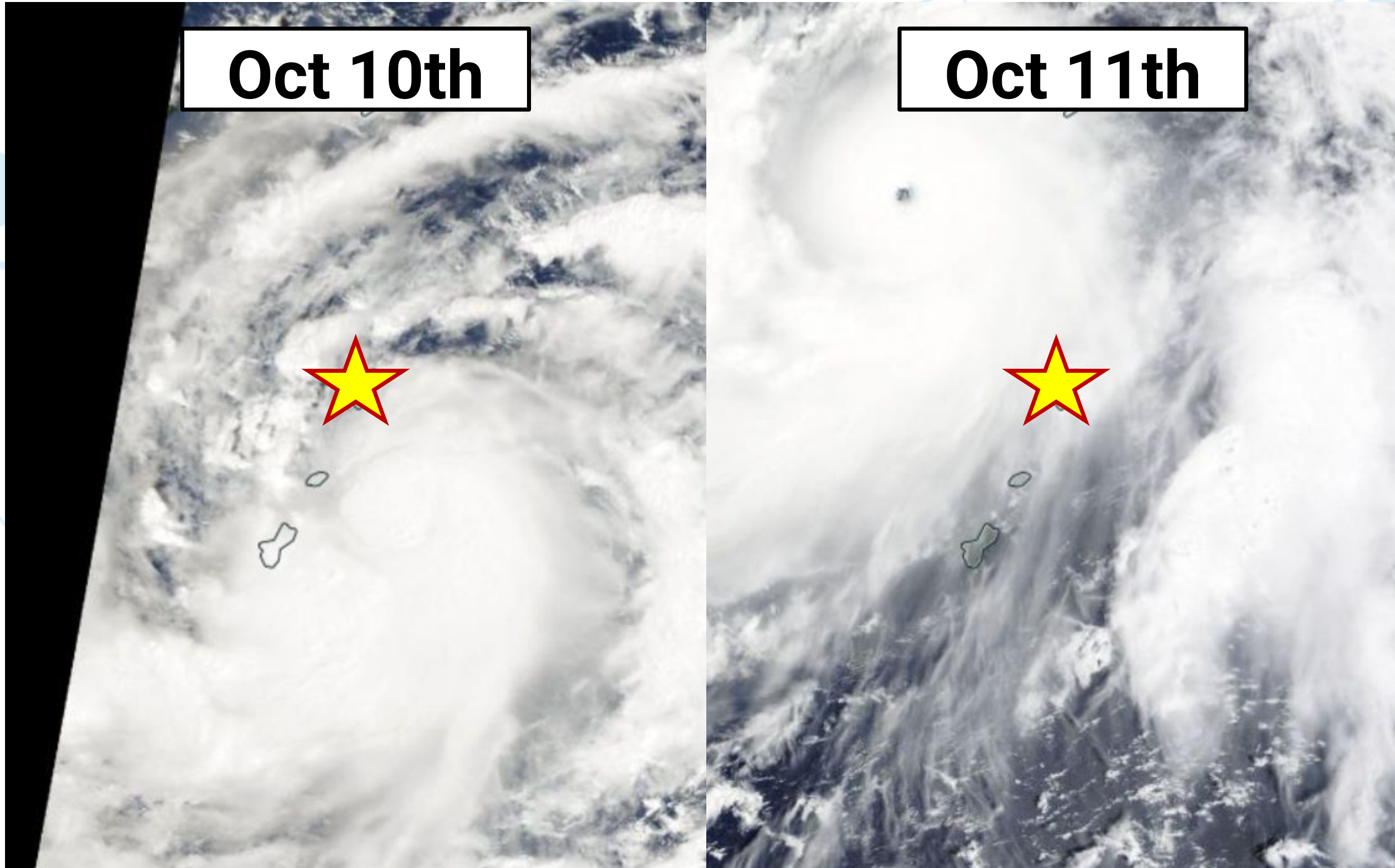


Typhoon Bolaven (October 2023)

Oct 10th



Oct 11th

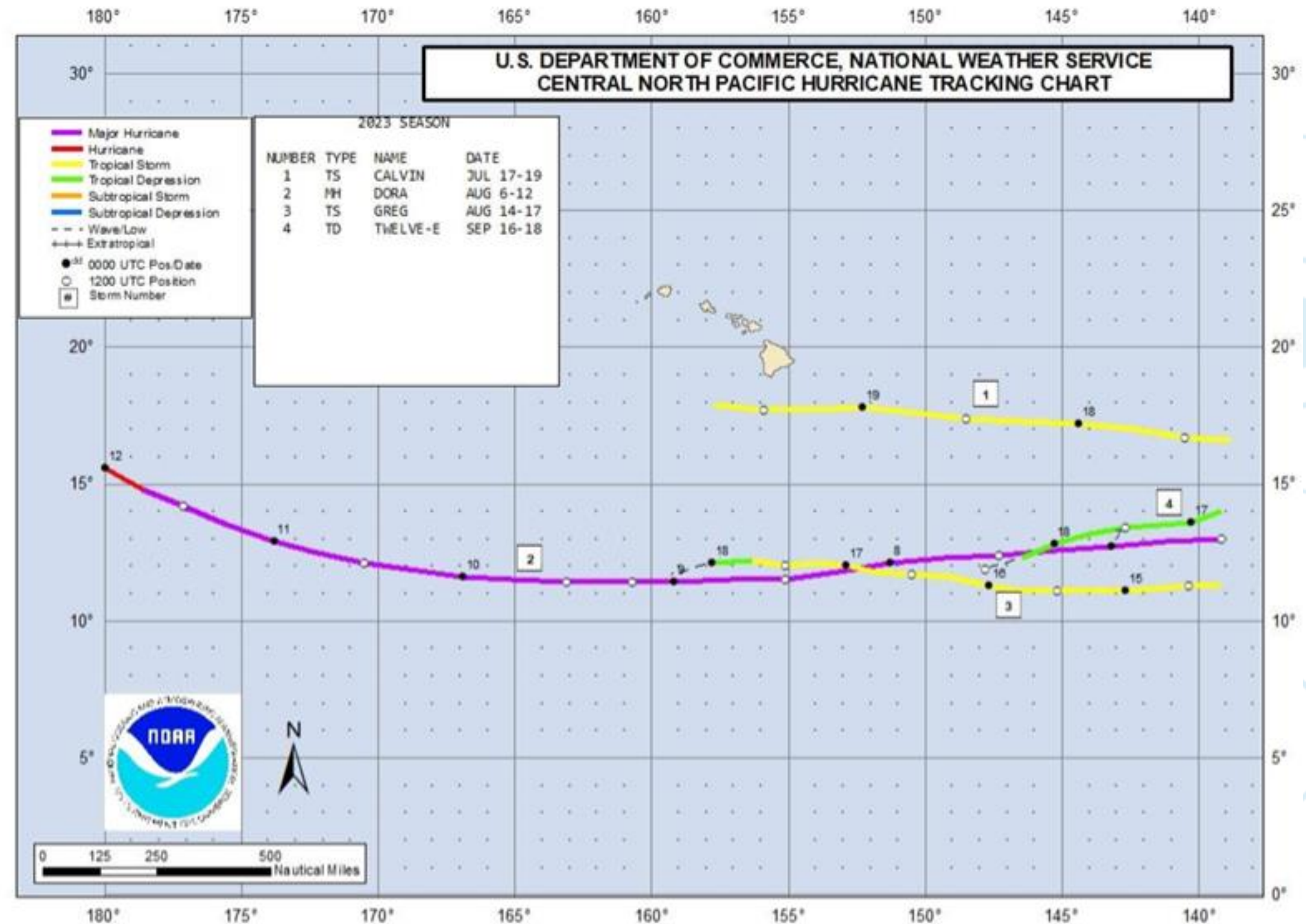


Summary of Central North Pacific TCs in 2023

Source: WFO Honolulu

- 4 TCs in the CNP basin during 2023 (average)
- August 2023: Hurricane Dora passed well south of the Hawaiian Islands
 - Dora far to the south and an extremely strong high pressure system to the north led to damaging winds and a dry air mass across Maui and nearby islands
 - Damaging winds contributed to fast-moving wildfires on August 8th, with over 100 deaths in Lahaina, Maui
 - deadliest US wildfire in more than 100 years

2023 Hurricane Season Tropical Cyclone Track Map (Preliminary):

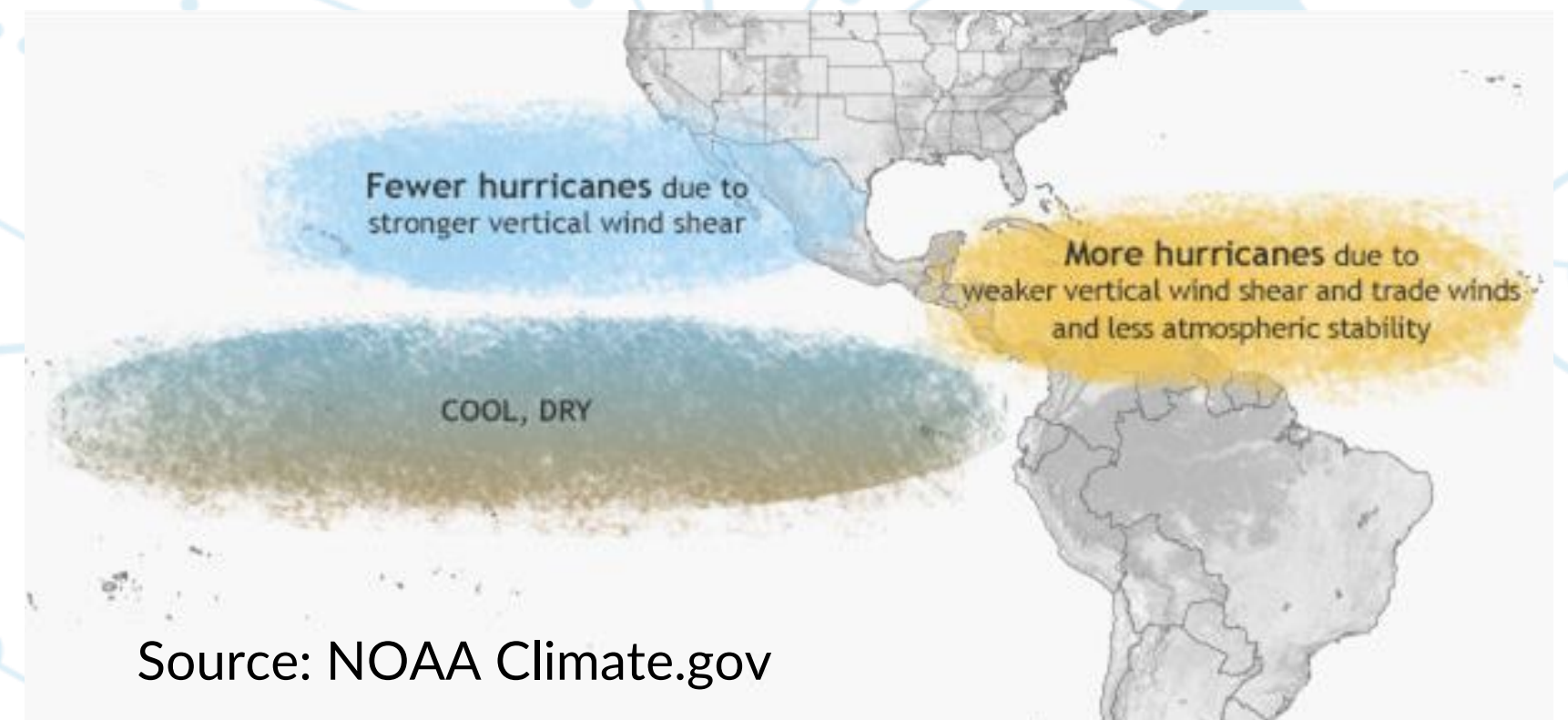
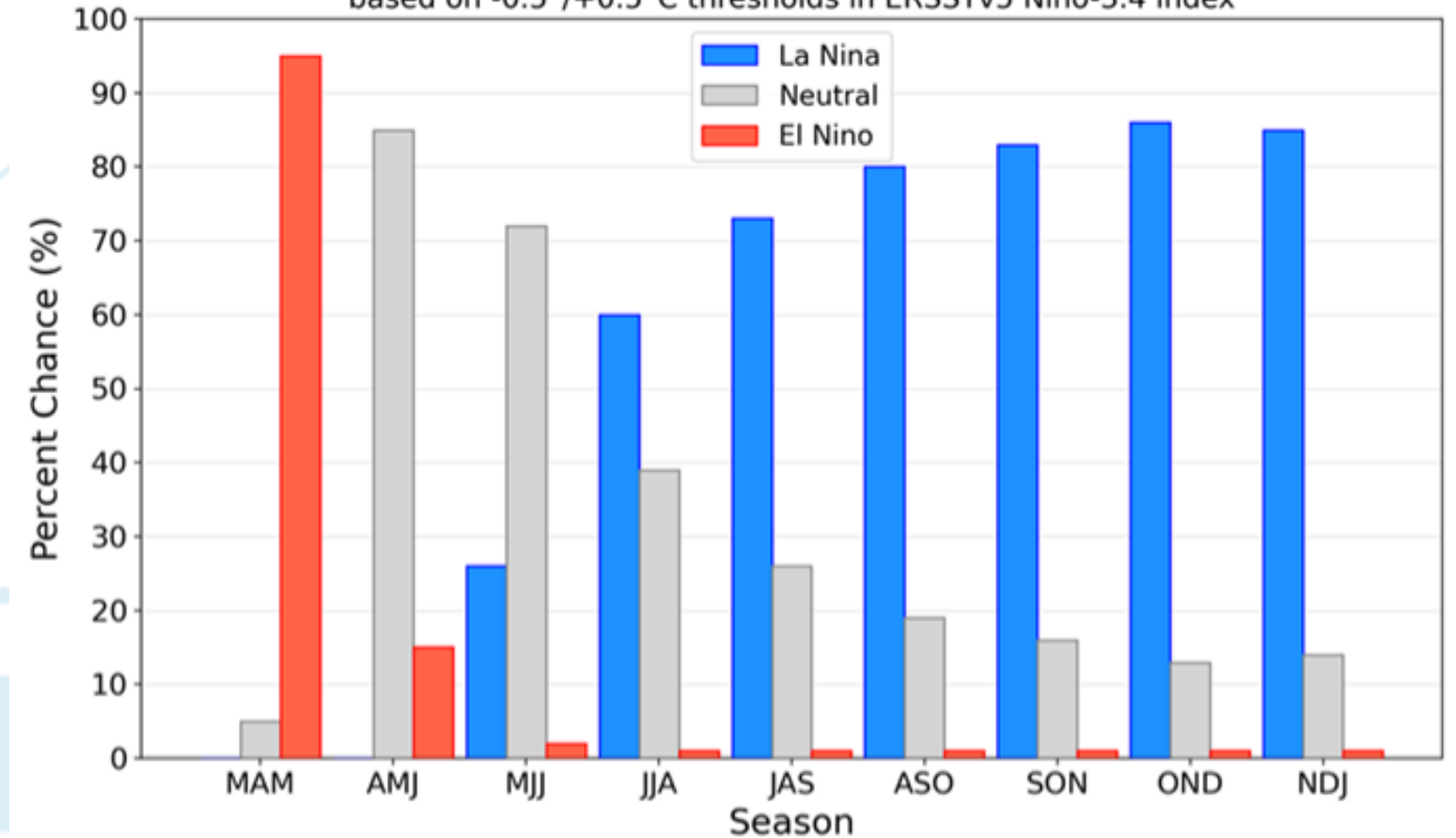


Looking Ahead...Rest of 2024

- **2024 is a transition year...**
 - El Niño fading quickly
 - La Niña favored to materialize the next few months (60% chance of La Niña developing by June-August 2024)
- **Western North Pacific Basin: Forecasts of La Niña, continued negative phase of the Pacific Decadal Oscillation (PDO), and a busy Atlantic basin forecast favors yet another below normal TC year for the WNP basin**
- **Central North Pacific Basin: Reduced activity is usually favored due to enhanced vertical wind shear and higher activity forecasted in the Atlantic basin**

Official NOAA CPC ENSO Probabilities (issued Apr. 2024)

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



Quick Plug for Official NOAA TC Outlooks

Western North Pacific TC Outlook

Outlook will be presented during WFO Guam's 4th Annual Regional Climate Conference on **23 May 2024**

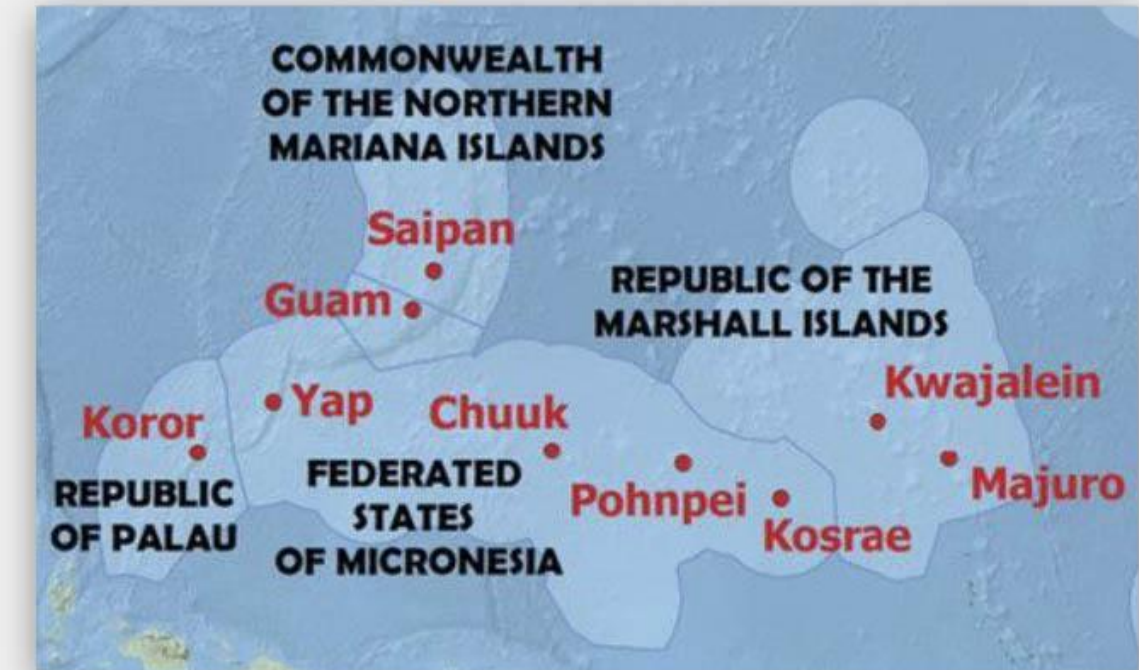
Central Pacific Hurricane Outlook

NOAA issues its outlook for each hurricane season in the Central Pacific during an **in-person news conference at the University of Hawai'i at Mānoa in mid to late May**

American Samoa TC Outlook

Press release in October

WFO Guam presents: 4th Annual Regional Climate Conference



23 May 2024, 0900-1200 ChST
May 22, 1300-1600 HST / 1900-2200 EDT

TOPICS

2024 USAPI Tropical Cyclone Outlook
Mapping Disaster Impacts with Drones
January 2024: Extreme Waves and Inundation
FSM Homeowners Handbook
Ocean Observing and Capacity Building
Findings of the 5th National Climate Assessment
USGS-USAID Landslide Mapping Across the FSM
Collaboration for Sustainable Futures



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Summary

2023 Overview and 2024 thus far

TC activity was well below normal for western North Pacific (WNP) basin, with a distribution that did not follow the typical expectations for an El Niño onset year

- 2023 was the fourth year in a row with below normal typhoon counts across the WNP basin
- Typhoon Mawar (worst hit to Guam since December 2002)
- There has been no TC activity in the WNP basin so far in 2024
- TC activity was average for central North Pacific basin

Outlook for the remainder of 2024

- Forecast for onset of La Niña the next several months would typically favor a reduced TC threat for islands of Micronesia and Hawaii
 - Important to note that ENSO based tropical cyclone patterns are typical, but not guaranteed, as evidenced by 2023/2024 El Niño
 - Official NOAA TC outlooks for WNP and CNP will be issued next month



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