

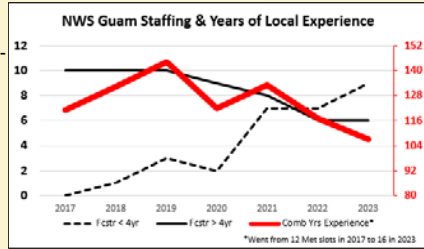
Maintaining Vital Relationships between the NWS & Emergency Managers via Collaborative Training

Background

Putting into practice the National Weather Service (NWS) Mission of “**providing weather, water and climate data, forecasts, warnings, and impact-based decision support services for the protection of life and property and enhancement of the national economy**” is a dynamic process required of all NWS forecasters. When it comes to the provision of ‘impact-based decision support services’, how do forecasters know just what our partners—Emergency Managers (EMs)—need for their decision making? Furthermore, when faced with a significantly-changed staff of meteorologists from retirements and the addition of new hires, how can new forecasters quickly develop relationships and learn of our partners’ needs?

The NWS Weather Forecast Office (WFO) Guam invests in relationship-building through collaborative training exercises and partner briefings. Annual tropical cyclone (TC) exercises have begun incorporating a briefing component with EMs to provide forecasters a safe place to develop briefing skills while also learning from EMs, through their questions and discussion, just what information they need to make their decisions.

Additionally, new probabilistic TC graphics, produced by the Central Pacific Hurricane Center (CPHC), are now available, operationally, for the Western Pacific. A number of partner briefings have been held to introduce EMs to the new suite of graphics and to teach them how to properly incorporate them into the decision-making processes.



Multyear comparison of ‘experienced’ forecasters (more than 4 yrs forecasting on Guam) and ‘developing’ forecasters (less than 4 yrs forecasting on Guam), and the combined years of experience forecasting on Guam of all staff forecasters, as of January 1st of each year. (Note, in 2017, all 10 forecasters were ‘experienced’, while in 2023, the staffing is expected to consist of 15 forecasters.

Method #2: Introducing EMs to New Probabilistic TC Graphics

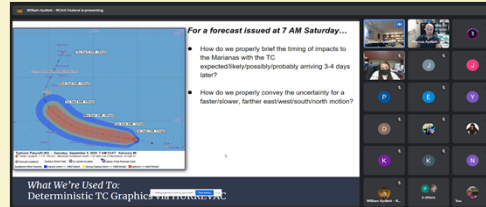
Ensuring EMs have the information readily available from the NWS to assist them in their decision-making process is a critical need. Graphical forecasts, especially those for TCs, provide a

wealth of information including storm track, motion, intensity, scope of winds, and more importantly, timing.

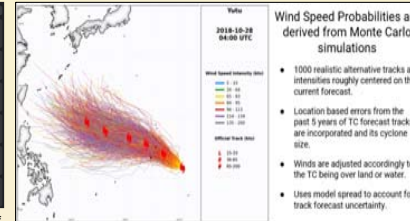
However, while traditional HURREVAC-produced graphics utilized to depict approaching TCs provide very specific, ‘single-state’ forecast metrics of intensity, path, and timing, these graphics fail to truly convey the inherent uncertainty of TC behavior (i.e., motion and intensity).

In 2021, the CPHC began routinely producing new probabilistic TC graphics for the West Pacific. These graphics have existed for several years for the Atlantic, East & Central Pacific.

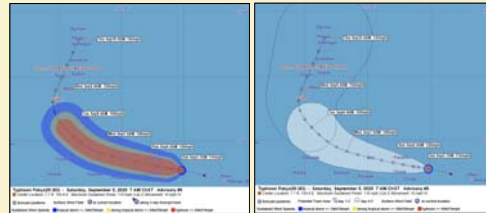
To ensure EM partners across the region are aware of, and can properly understand the new information provided in these graphics, WFO Guam has engaged in a number of in-person and web-based conferences to introduce the graphics, the background in how they’re produced, and provide a few comparative case studies proving their value in the storm evaluation process.



Screengrab from an early-year Zoom briefing to EMs of Guam and the Commonwealth of the Northern Mariana Islands (CNMI) to introduce new probabilistic TC graphics that will become commonplace in TC briefings and on WFO Guam’s web page.



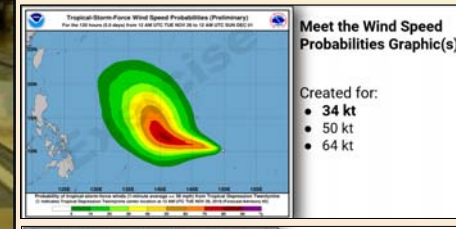
Probabilistic TC graphics are produced via simulation of 1000 slightly-perturbed TC tracks to depict storm uncertainty.



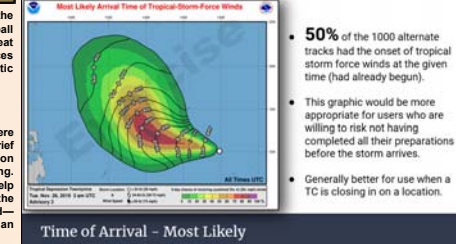
Until early 2022, HURREVAC graphics were the only TC graphics produced for the western Pacific. These graphics were easy to understand with their center line depiction of a TC’s expected path and wind radii, but offered little detail to depict uncertainties in motion, timing, and impacts.



A bowling analogy to depict the uncertainty of down-lane ball positioning has shown great value in helping audiences understand the probabilistic approach to TC forecasting.



Meet the Wind Speed Probabilities Graphic(s)
Created for:
• 34 kt
• 50 kt
• 64 kt



• 50% of the 1000 alternate tracks had the onset of tropical storm force winds at the given time (had already begun).
• This graphic would be more appropriate for users who are willing to risk not having completed all their preparations before the storm arrives.
• Generally better for use when a TC is closing in on a location.

Method #1: Strengthening Relationships Via Collaborative Training Exercises

In the past, WFO Guam TC training exercises were in-house events that focused strictly on:

- TC watch / warning timing and location,
- Inputting Joint Typhoon Warning Center (JTWC) TC wind data into the local forecasts, and

- Creating appropriate forecast, watch, warning, and advisory texts.

Because of a large changeover in personnel, WFO Guam needed a more-robust exercise to: 1) train forecasters in TC operational duties, and 2) provide face-to-face

engagement between forecasters and EMs to develop new relationships.

The TC training exercise had a number of ‘deliverables’ to be performed by the forecaster:

- Creating east-to-understand TC graphics;
- Assessing TC track timing to establish proper watch & warning timing; and
- Creating appropriately worded forecast, watch, warning, and advisory texts.

New additions to the TC training exercise focused on increased and improved plain-language communication to the public:

- Creating social media content;
- Creating and delivering informative short weather briefings to a guest audience of EMs.

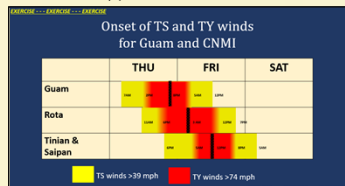
EM participation brings an important dimension to WFO training as their questions and comments guide forecasters into a better understanding of their needs. To solicit additional feedback, EMs were asked a number of questions, including:

- What additional information would better equip you for your decision making?
- Did the speaker offer to help connect you to some one appropriately qualified if your question was outside their expertise?
- Was the speaker informative in their briefing and subsequent Q&A?

An assortment of briefing slides presented on in the exercise briefings. The slides offered different ways for critical information to be delivered to convey the anticipated impacts of a direct hit by a super typhoon.



Forecasters, Nick & Bruce, work through the operational aspects of the TC training exercise, assessing typhoon tracks to determine typhoon watch/warning timing for the islands.



A unique aspect of forecasters participating in creating and delivering briefings is seeing the creation of new and creative graphics to convey hazards, impacts, and timing of events. EMs were impressed with a number of the timeline graphics and provided additional feedback in how some could be refined further to be of great use in active TC events.



Brandon Aydlett delivers a sample Heavy Weather Brief (HWB) to an audience of Emergency Managers. HWBs are the long-recognized weather briefings presented to regional EMs for each TC expected to affect the islands.

Future Collaborative Engagements

- Bring NWS forecasters to the EOC to observe their operations and learn how they use our information, and more specifically, what they need to make their decisions.
- Incorporate other islands’ EOCs and Weather Service Offices for additional training experiences.
- Include opportunities to work with media partners with varying weather scenarios.

Special Thanks & Recognition

Special thanks goes to the NWS Guam partners, **Guam Homeland Security Office of Civil Defense (GHS/OCD)** and the **Commonwealth of the Northern Mariana Islands Homeland Security and Emergency Management Office (CNMI HSEM)** for their ongoing support and collaboration with the NWS Guam. The great working relationship we have directly benefits the communities we serve with our collective missions to ensure the public is ready to face the worst that nature can bring.