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Service Change Notice 23-30
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From: Greg Schoor, Chief
 Marine, Tropical and Tsunami Services Branch

Subject: Operational Implementation of Arrival of Tropical Storm-Force Winds Graphics for the South Pacific and Western North Pacific Based on Forecasts from the Joint Typhoon Warning Center (JTWC) on or around May 15, 2023

On or about May 15, 2023, the National Weather Service (NWS) will operationally implement graphics that project the arrival time of tropical storm-force winds for tropical cyclones in the South Pacific and western North Pacific basins based on forecasts issued from the Joint Typhoon Warning Center (JTWC). These graphics will be generated by the NWS Central Pacific Hurricane Center (CPHC) and use the same format as graphics provided on [hurricanes.gov](https://www.hurricanes.gov) for the central and eastern North Pacific and the Atlantic basins based on NWS forecasts.

The anticipated arrival of sustained tropical storm-force winds from a tropical cyclone is a critical threshold for coastal and inland communities. For example, emergency managers use this information to help determine when to begin and complete coastal evacuations, while members of the public need to know when to prepare their homes or businesses in advance of hazardous weather. Once sustained tropical storm-force winds begin, such preparations usually become too dangerous or difficult.

Historically, many decision makers have inferred the arrival of sustained tropical storm-force winds from deterministic tropical cyclone forecasts, without accounting for tropical cyclone track or size uncertainty. The risk in not factoring in these elements of uncertainty is that communities may have less time to prepare if a tropical cyclone speeds up or increases in size beyond the initial forecasts.

To better meet the needs of users, a set of graphics was developed that depict when sustained tropical storm-force winds from an approaching tropical cyclone could arrive at individual locations. The maps were developed and tested using social science techniques, including one-on-one telephone interviews, focus groups, and surveys with emergency managers, broadcast meteorologists and NWS meteorologists to gather opinions on the idea, content, and design of the products.

The timing graphics are created using the same Monte Carlo wind speed probability model currently used to determine the risk of tropical storm-force and hurricane-force winds at individual locations. This model constructs 1,000 plausible scenarios using the official NWS or JTWC tropical cyclone forecasts and their historical errors. Additional information on this product and the underlying technique are located online at:

https://www.nhc.noaa.gov/about/pdf/About_Windspeed_Probabilities.pdf

There will be two thresholds for producing the Arrival of Tropical Storm-Force Winds Graphics for South Pacific and western North Pacific tropical cyclones:

1. **Earliest Reasonable Arrival Time:** This graphic identifies the time window that users at individual locations can safely assume they will be free from tropical storm-force winds. Specifically, this is the time before which there is no more than a 1-in-10 (10 percent) chance of seeing the onset of sustained tropical storm-force winds. This is when preparations should ideally be completed for those with a low tolerance for risk.
2. **Most Likely Arrival Time:** This graphic identifies the time before or after which the onset of tropical storm-force winds are equally likely to occur. This graphic would be more appropriate for users who are willing to risk not having completed all their preparations before the storm arrives.

Timing information will only be available for locations that have at least a five percent chance of experiencing sustained tropical storm-force winds during the next five days.

Each of these thresholds will also be available overlaid on top of the cumulative 5-day probability of tropical storm-force winds, providing a single combined depiction of the likelihood of tropical storm-force winds at individual locations, along with their possible or likely arrival times.

The graphics for the South Pacific and western North Pacific will be updated using forecast information from the Tropical Cyclone Warning bulletins from JTWC within those basins. Arrival times will be depicted with higher temporal resolution (i.e., in 6-hour intervals) during the first day of the 5-day forecast, increasing to lower temporal resolution (i.e., in 12-hour intervals) after the first day of the 5-day forecast period. Arrival times will be referenced to Samoa Standard Time (SST) on the South Pacific graphics and to Chamorro Standard Time (ChST) on the western North Pacific graphics.

When JTWC Tropical Cyclone Warning bulletins are issued for the South Pacific or western North Pacific basins, the graphics will be available within 15 minutes after the release of the product from JTWC. The Tropical Cyclone Warning bulletin is scheduled for issuance at 0300, 0900, 1500 and 2100 Coordinated Universal Time (UTC). The Time of Arrival products will only be produced for any tropical cyclone system JTWC is

issuing warnings on which have at least one forecast point within 10S-20S and 164.5W-178.5W for the South Pacific and within 0-25N and 180-130E for the western North Pacific. JTWC Tropical Cyclone Warning bulletins can be found under the following World Meteorological Organization (WMO) identifiers:

JTWC Product -----	WMO ID -----
Southern Hemisphere TC Warning	WTPS3[1-5] PGTW
Western North Pacific TC Warning	WTPN3[1-5] PGTW

More information on the products issued by JTWC can be found here:

<https://www.metoc.navy.mil/jtwc/jtwc.html?notices>

Examples of the Time of Arrival of Tropical Storm-Force Winds graphics can be found at:

South Pacific: <https://www.weather.gov/ppg/spacTropicalExample>.

Western North Pacific: <https://www.weather.gov/gum/wpacTropicalExample>.

When there are active TCs in the South Pacific within 10S-20S and 164.5W-178.5W and in the western North Pacific within 0-25N and 180-130E, the graphics will be provided at the following websites:

South Pacific: <https://www.weather.gov/ppg/spacTropical>.

Western North Pacific: <https://www.weather.gov/gum/wpacTropical>.

CPHC produces the graphics in KMZ format on the same webpages noted above. Additional information about the content of NWS tropical cyclone wind timing graphics can be found online at:

<https://www.nhc.noaa.gov/aboutnhcgraphics.shtml?#TOA>

Note: The products will not have a backup production site in a case where conditions or events exist that prevent the product from being issued from the original production source at JTWC.

If you have questions regarding this notice, please contact:

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National Service Change Notices are online at:

<https://www.weather.gov/notification/>

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