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2025 Northwest Pacific Typhoon Season Outlook

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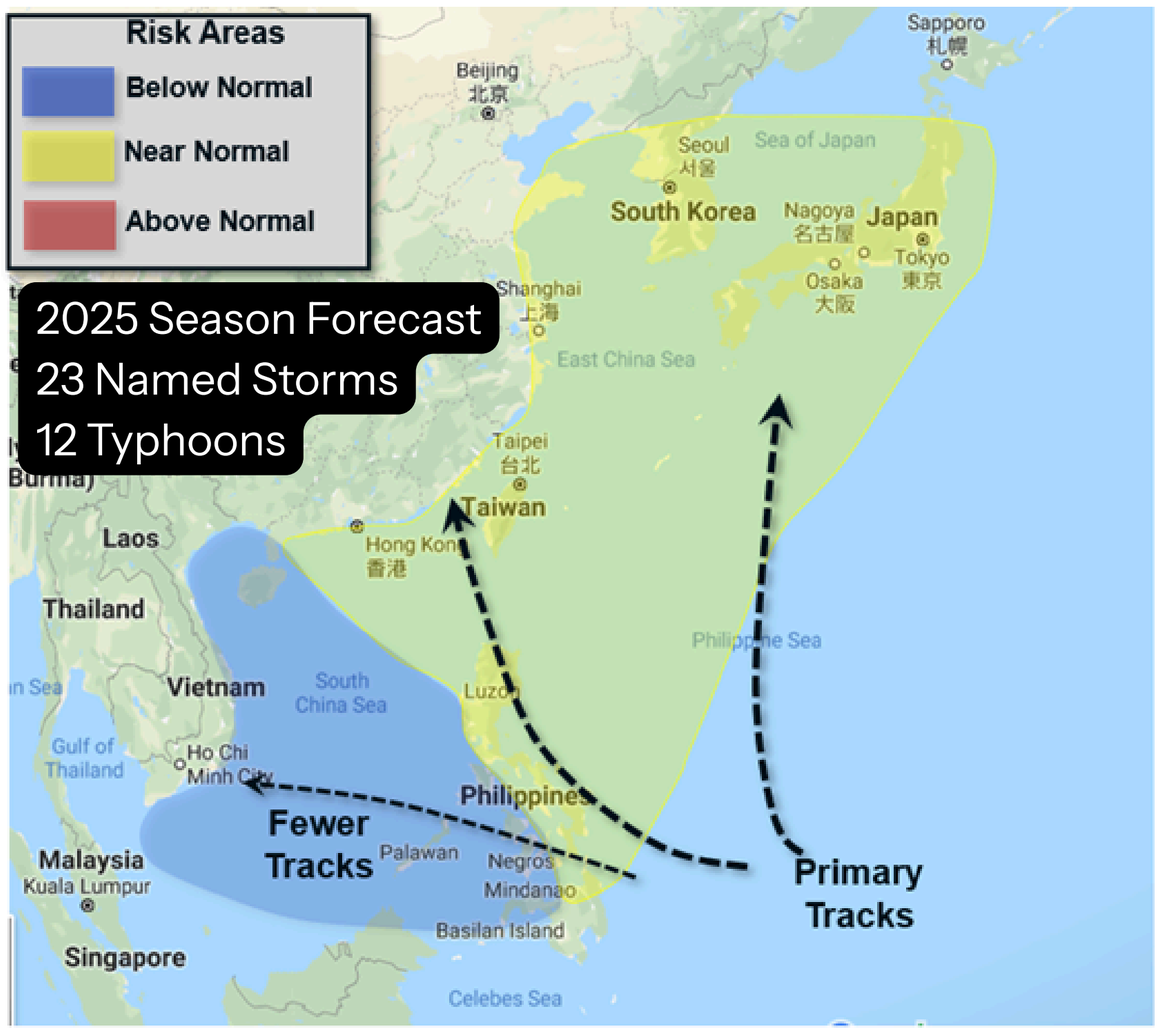
European Model and Positive Indian Ocean Dipole Indicate Reduced Activity Across the Northwest Pacific

Key factors influencing the Northwest Pacific:

- The end of La Niña
- Indian Ocean Dipole (IOD)
- Cooler water temperatures



2025 Risk Areas

Season Outlook

The 2024 typhoon season was the fifth consecutive season with below-average numbers of tropical storms and typhoons. Of the 26 named storms that formed last year, only 13 became typhoons. Normal is 26 named storms but with 16 of those becoming typhoons. The West Pacific has been quiet so far this year, with not a single depression or named storm as of the second week of April.Early indications are that 2025 will be another relatively quiet typhoon season.

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El Nino/La Nina

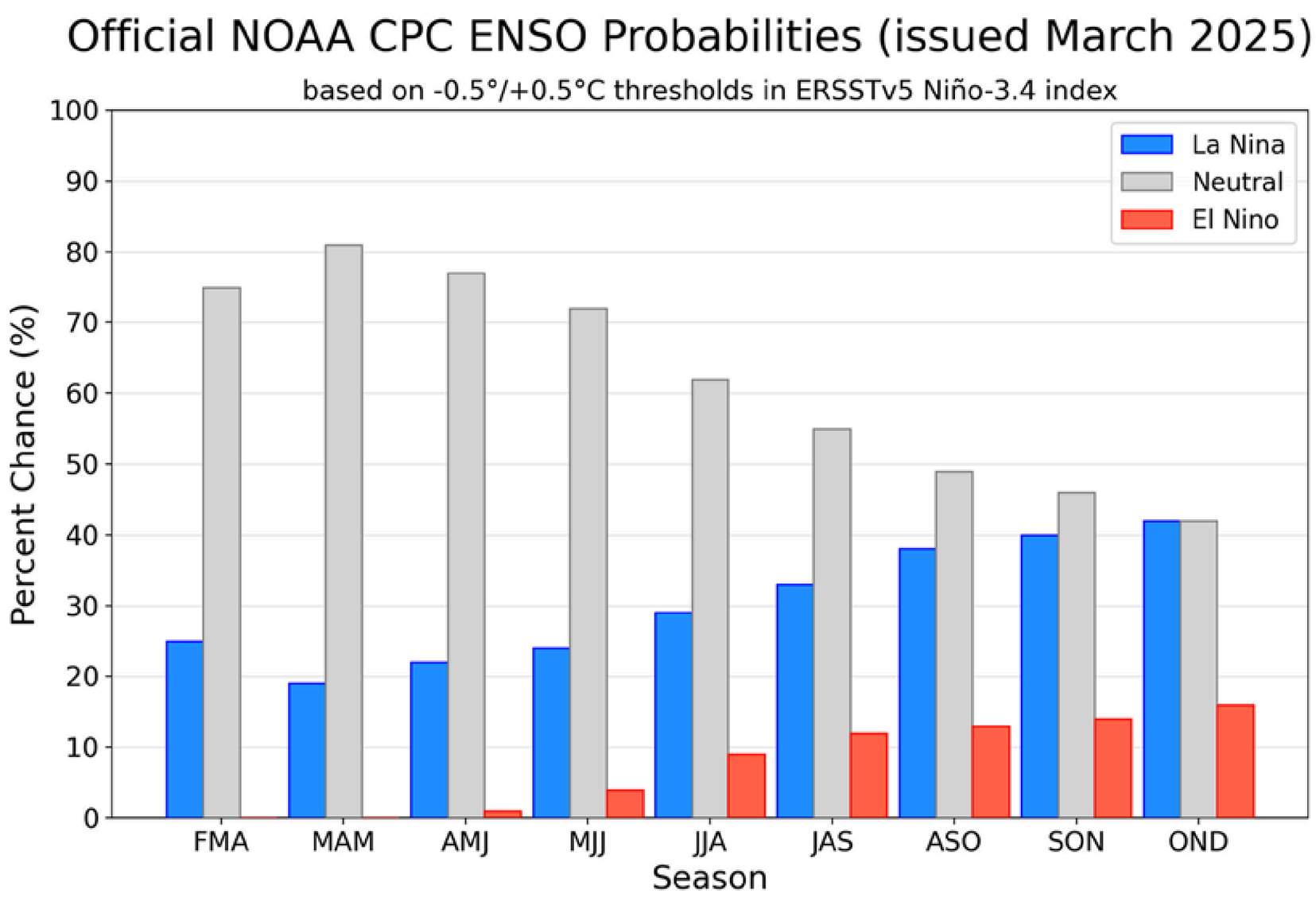
One primary driver of typhoon activity in the Northwest Pacific is the state of El Niño Southern Oscillation (ENSO). ENSO is represented by the Oceanic Niño Index (ONI), which is defined as the 3-month average surface temperature anomaly for the Niño 3.4 region in the Tropical Pacific. When the sea surface temperature anomaly is less than 0.5C below normal over a three-month period, it is identified as a La Niña.Conversely, when the average sea surface temperature anomaly is greater than 0.5C for a three-month period, it is identified as an El Niño.

Last season, the tropics were dominated by a moderate to strong La Niña. During a La Niña, warm air sinks in the eastern part of the Pacific Basin and rises in the western part. This inhibits typhoon activity in the West Pacific. For 2025, the Tropical Pacific appears to be switching to neutral conditions. The La Niña of last season is fading as water temperatures warm into the neutral area between La Niña and El Niño.

All computer models are predicting that the current neutral conditions will prevail through the typhoon season. The current prediction is for a 49% chance neutral conditions and a 38% chance of La Niña this summer and fall. This would neither be an enhancing or an inhibiting factor this season.

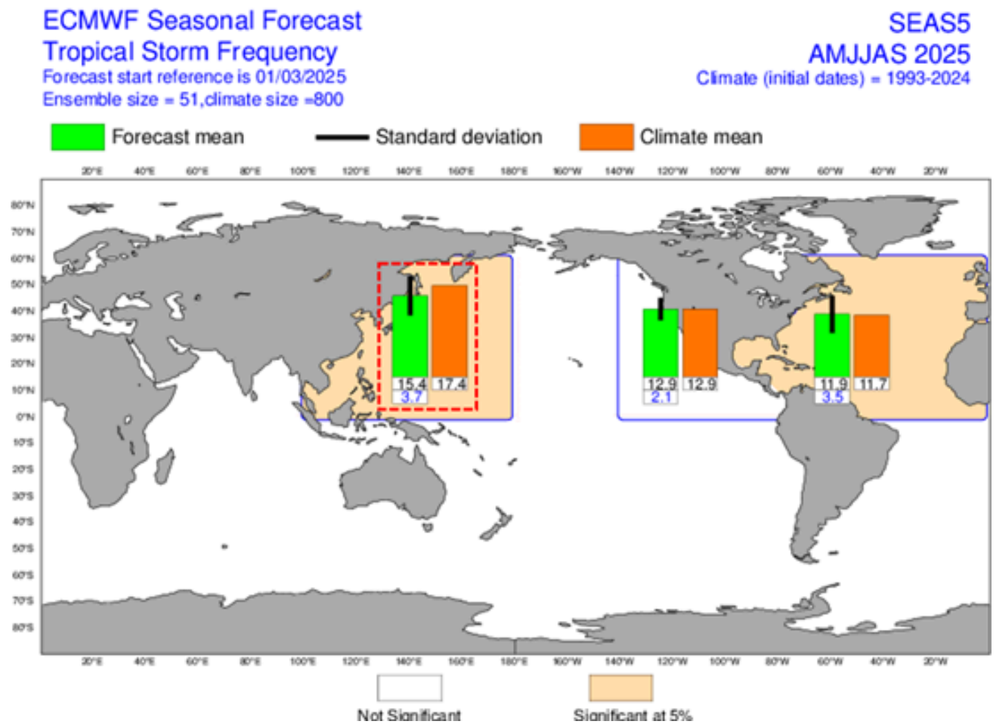
Atlantic Water Temperatures

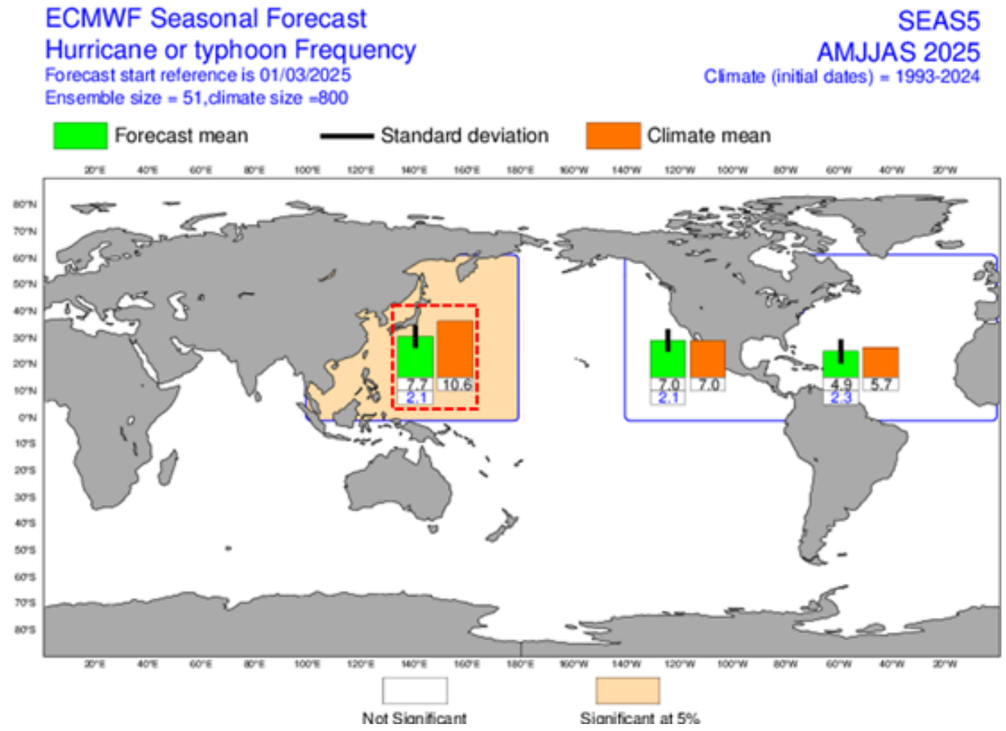
Atlantic water temperatures have cooled significantly since last season. This is particularly true of the region between the eastern Caribbean and Africa. The reason is a stronger and farther south Azores-Bermuda High that is generating stronger easterly trade winds, resulting in upwelling of cool water in the deep tropics.If the current pressure and wind flow across the deep tropics were to continue through the summer, then this would result in decreased hurricane development east of the Caribbean.However, models are forecasting just the opposite – a weaker and farther northeast position of the Azores-Bermuda High.The implications would be enhanced hurricane activity east of the Caribbean but a better chance that hurricanes would turn to the north prior to reaching the Caribbean Sea.



European Model

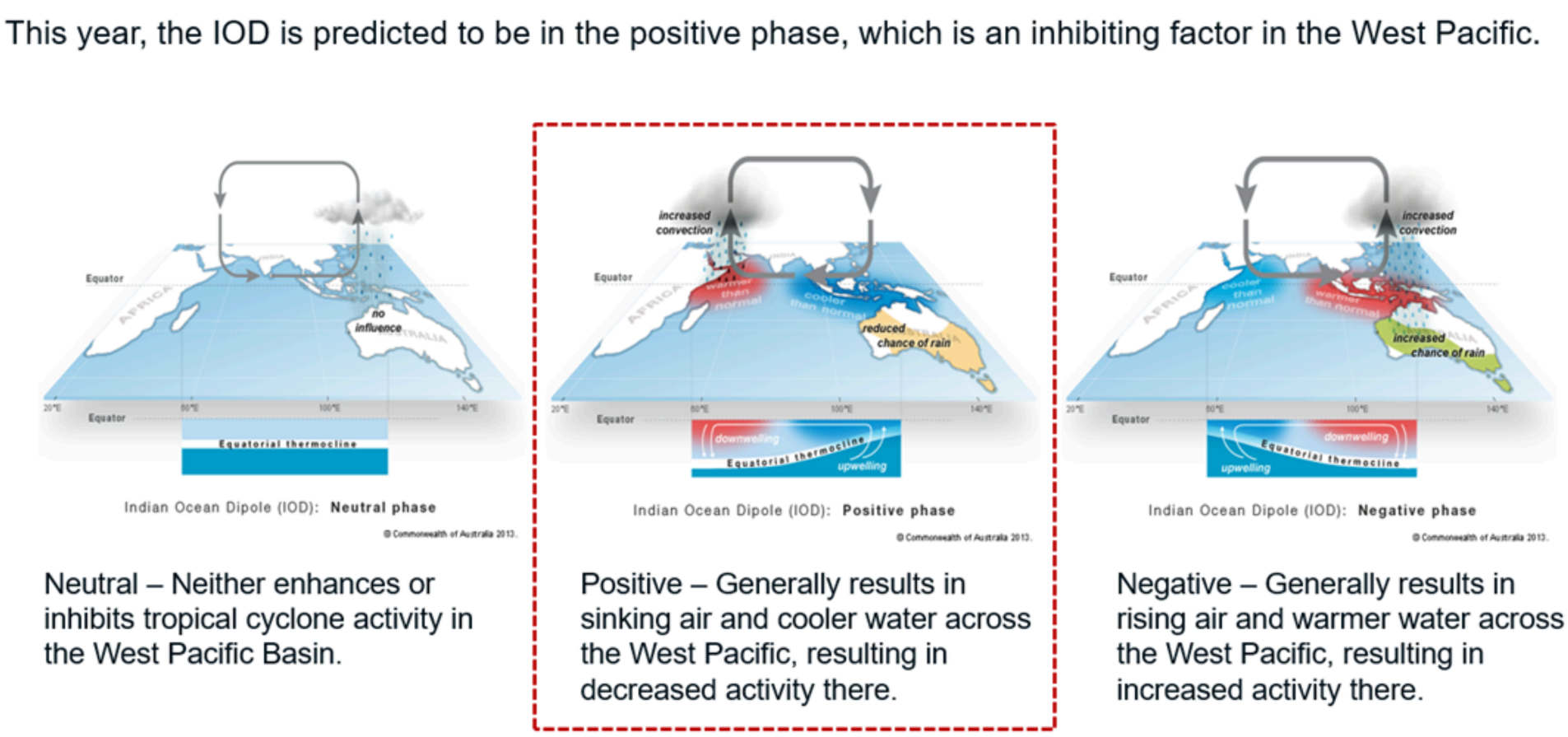
Each year, the European model produces seasonal tropical cyclone forecasts around the world. For 2025, the European model is predicting 15.4 named storms from April through October, compared to the normal number of 17.4 named storms during the same period. As for typhoons, the European model is predicting a total of 7.7 through October (normal is 10.6). In general, the European model is predicting that activity will be below normal through October.





Indian Ocean Dipole (IOD)

Another feature which can significantly influence Northwest Pacific typhoon activity is the Indian Ocean Dipole (IOD). The IOD is defined by the difference in sea surface temperatures between the eastern and western tropical Indian Ocean. The current forecast is for a positive (warm) phase through much of the season. During a positive phase, air tends to rise over the Indian Ocean and sink over the western Pacific (particularly the South China Sea). This suppresses typhoon activity in the West Pacific basin. A positive IOD could be a significant inhibiting factor this season.



Source: http://www.bom.gov.au/climate/enso/#tabs=Indian-Ocean

Water Temperatures

Water temperatures in the northwest Pacific are generally not a major issue during typhoon season, as the water is always warm enough for typhoons to form. However, water temperatures so far this season are significantly cooler than average across both the South China Sea and south of Japan. While the water isn’t cool enough to prevent typhoons from forming, the cooler water may limit the number of very strong typhoons this season.

Our April Forecast

Most seasonal predictors are indicating that typhoon activity across the West Pacific will be below normal again this season. La Niña has faded to neutral this year, which will not be an enhancing or an inhibiting factor.

Sinking air in the South China Sea due to the current and predicted positive Indian Ocean Dipole could limit typhoon activity across the Northwest Pacific this year. The European model is also predicting a below-normal season in the basin.

Considering the factors mentioned above, we think that activity will be below normal again this year. In particular, the first half of the season will be below normal. Stronger typhoons may be concentrated farther north and east than is typical, threatening southeast China through Japan more than Vietnam. The South China Sea may be relatively quiet again this season. We are predicting a total of 23 named storms this season, which is a little below the 30-year average of 26. As for typhoons, we are predicting a total of 12 again this season, which is below the 30-year average of 16 typhoons.

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