

Early May Forecast for Northwest Pacific Typhoon Activity in 2024

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by Dr Adam Lea
EuroTempest Ltd, London, UK

TSR predicts that Northwest Pacific typhoon activity in 2024 will be around 20% below the 1991-2020 30-year norm.

Summary: The TSR (Tropical Storm Risk) early May forecast for Northwest Pacific typhoon activity in 2024 anticipates a season with below-norm activity. TSR uses the strong link ($R^2 = 0.82$; 1993-2022) between the annual Northwest Pacific ACE index and August-September-October (ASO) ENSO combined with the expectation that a transition to weak or moderate La Niña conditions will continue and persist through ASO 2024. Although sizable uncertainties remain and the forecast skill at this range is historically low, TSR anticipates there is a 73% likelihood that Northwest Pacific ACE in 2024 will be below the 1991-2020 30-year norm and anticipates there is a 66% chance Northwest Pacific ACE in 2024 will be in the lower tercile of years 1991-2020.

[1. TSR May 2024 Northwest Pacific Seasonal Typhoon Activity Forecast](#)

Further information on the TSR statistical prediction models and adjustments that are used to generate the forecasts below can be found in [Section 2](#) of Supplementary Information.

1.1 Forecast Northwest Pacific ACE Index and System Numbers in 2024:

		ACE Index	Intense Typhoons	Typhoons	Tropical Storms
TSR Forecast	2024	225	7	15	25
30-yr Climate Norm	1991-2020	301	9.3	16.0	25.5
10-yr Climate Norm	2014-2023	257	8.2	13.9	23.7
Forecast Skill at this Lead	2014-2023	0%	0%	0%	0%

The forecast tercile probabilities (1991-2020 data) for the 2024 Northwest Pacific typhoon season ACE index are as follows: only a 10% probability of being upper tercile, a 24% likelihood of being middle tercile and a 66% chance of being lower tercile.

1.2 Forecast Probability of Exceedance Plot for the Northwest Pacific ACE index in 2024:

See [Section 3](#) in the Supplementary Information for motivation behind probability of exceedance charts. Figure 1 displays our current forecast for the 2024 Northwest Pacific ACE index in terms of PoE. The forecast PoE curve is computed using the robust method described in Section 3 of Saunders et al. (2020) while the climatology PoE curve is computed directly from observations. The figure specifies the current chance that a given ACE index will be reached in 2024 and how this chance compares to climatology.

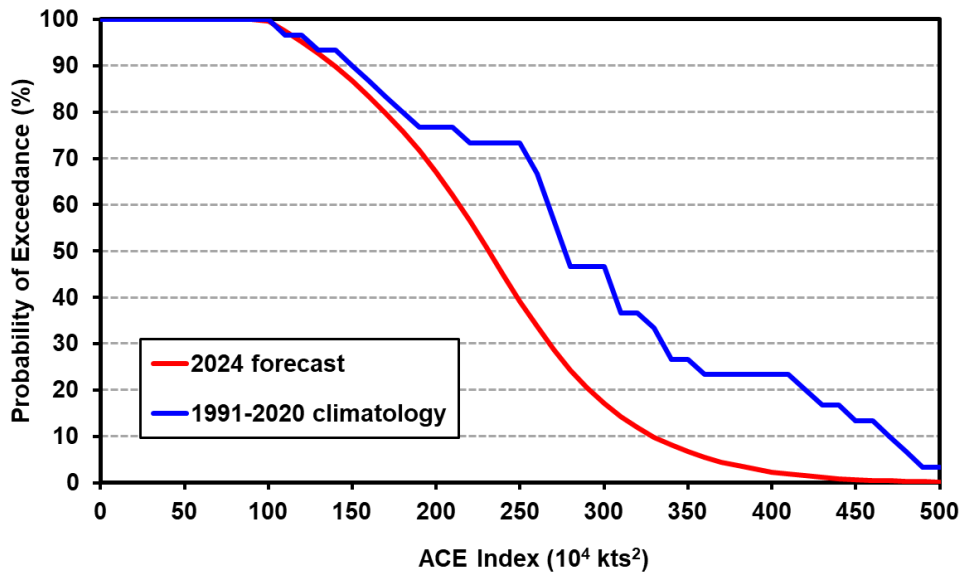


Figure 1. Forecast probability of exceedance (PoE) plot for the Northwest Pacific ACE index in 2024. The plot displays two sets of PoE data comprising the TSR forecast PoE curve issued in early May and the 1991-2020 climatology PoE curve.

[2. Factors Influencing the May 2024 TSR Forecast](#)

ENSO: The consensus forecast value for ASO ENSO ONI that we employ is -0.7°C . When La Niña is present during ASO the anomalous Walker circulation that occurs in tandem with La Niña leads to strengthened easterly trade winds over the Northwest Pacific region where tropical cyclones form and track. These strengthened easterly trades in turn weaken the local cyclonic vorticity and increase the local vertical wind shear, thereby giving environmental conditions that lead to a lower number of intense typhoons and to a reduced seasonal ACE index.

Pacific Decadal Oscillation: The Pacific Decadal Oscillation (PDO) is often described as a long-lived El Niño pattern of Pacific climate variability. Warm phases of the PDO are linked to enhanced typhoon activity and vice-versa. Through April 2024 the PDO has been in a strongly negative phase which historically tends to suppress typhoon activity, however the correlation between April PDO and upcoming typhoon activity over the period 1965-2023 is weak (Pearson $r^2 \sim 0.05$).

[3. Confidence and Uncertainties](#)

ENSO: Our expectation for La Niña conditions through ASO 2024 has moderate confidence. Most of the model forecasts provided by IRI have persistently forecast weak or moderate La Niña conditions during ASO 2024 this year. There has been a slight decrease in the forecast strength of La Niña conditions from the consensus in the April update, so although it remains likely that La Niña conditions will develop, it may not develop until later in the year which would result in slightly more favourable conditions for typhoon activity through the season.

Skill: Historically the skill from early May forecasts for Northwest Pacific typhoon activity is low (see [Section 4b](#) in the Supplementary Information). This is due to the typical sizeable uncertainty in the ASO ENSO ONI value at this four month lead and because even if the ASO ONI value is anticipated correctly a spread in ACE levels can still ensue.

4. Forecast Archive and Next Forecast

The archive of all the TSR publicly released Northwest Pacific seasonal typhoon forecasts (from 2000 to 2024) may be viewed at https://www.tropicalstormrisk.com/for_typh.html. A TSR forecast update for the 2024 Northwest Pacific typhoon season will be issued on Friday 5th July, 2024.