



# May Forecast Update for Northwest Pacific Typhoon Activity in 2005

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## Forecast Summary

**TSR slightly reduces its forecast and anticipates the 2005 Northwest Pacific typhoon season will see activity close to average.**

The TSR (Tropical Storm Risk) May forecast update for Northwest Pacific typhoon activity in 2005 anticipates a near average season. The forecast spans the full Northwest Pacific season from 1st January to 31st December 2005 (95% of typhoons historically occur after 1st May) and is based on data available through the end of April 2005. The forecast includes deterministic and probabilistic projections for overall basin activity, and deterministic projections for the numbers of tropical storms, typhoons and intense typhoons. TSR anticipates that activity will be close to average overall but that tropical storm and typhoon numbers will be slightly above average. TSR's main predictor at this lead for overall activity is the forecast anomaly in August-September Niño 3.75 sea surface temperature (SST) which we anticipate will be  $0.13 \pm 0.46^\circ\text{C}$  warmer than normal this summer. Monthly updated forecasts for intense typhoon numbers and the ACE index will be issued through to early August.

## NW Pacific ACE Index and System Numbers in 2005

|                               |           | ACE<br>Index    | Intense<br>Typhoons | Typhoons          | Tropical<br>Storms |
|-------------------------------|-----------|-----------------|---------------------|-------------------|--------------------|
| TSR Forecast ( $\pm$ FE)      | 2005      | 314 ( $\pm$ 81) | 8.9 ( $\pm$ 2.6)    | 17.5 ( $\pm$ 2.9) | 27.6 ( $\pm$ 3.7)  |
| 40yr Climate Norm ( $\pm$ SD) | 1965-2004 | 305 ( $\pm$ 99) | 8.6 ( $\pm$ 3.0)    | 16.9 ( $\pm$ 3.7) | 26.8 ( $\pm$ 4.5)  |
| Forecast Skill at this Lead   | 1965-2004 | 32%             | 24%                 | 37%               | 33%                |

- Key: ACE Index = Accumulated Cyclone Energy Index = Sum of the Squares of 6-hourly Maximum Sustained Wind Speeds (in units of knots) for all Systems while they are at least Tropical Storm Strength. ACE Unit =  $\times 10^4$  knots<sup>2</sup>.
- Intense Typhoon = 1 Minute Sustained Wind > 95Kts = Hurricane Category 3 to 5
- Typhoon = 1 Minute Sustained Wind > 63Kts = Hurricane Category 1 to 5
- Tropical Storm = 1 Minute Sustained Wind > 33Kts
- SD = Standard Deviation
- FE (Forecast Error) = Standard Deviation of Errors in Simulated Real Time Forecasts 1965-2004
- Forecast Skill = Percentage Reduction in Mean Square Error Afforded by Cross-Validated Hindcasts 1965-2004 over Hindcasts Made with the 1965-2004 Climate Norm.
- Northwest Pacific = Northern Hemisphere Region West of 180°W Including the South China Sea. Any Tropical Cyclone (Irrespective of Where it Forms) Which Reaches Tropical Storm Strength Within this Region Counts as an Event.

There is a 30% probability that the 2005 Northwest Pacific typhoon season ACE index will be above average (defined as an ACE index value in the upper tercile historically ( $>331$ )), a 51% likelihood it will be near-normal (defined as an ACE index value in the middle tercile historically (237 to 331) and only a 19% chance it will be below-normal (defined as an ACE index value in the lower tercile historically ( $<237$ )). The 40-year period 1965-2004 is used for climatology.

Key: Terciles = Data groupings of equal (33.3%) probability corresponding to the upper, middle and lower one third of values historically (1965-2004).

## Key Predictors for 2005

The TSR predictors have changed from recent years. This follows a review of seasonal predictability over the extended 1965-2004 period of reliable data. Tropical storm and typhoon numbers are now forecast before May using the Niño 3 sea surface temperature (SST) from the prior September; from May they are forecast using April surface pressure over the region 17.5°N-35°N, 160°E-175°W. Intense typhoon numbers and the ACE index are now forecast in March and April using the February surface pressure in the central northern tropical Pacific region 10°N-20°N, 145°W-165°W; from May they are forecast from the forecast value for the August-September Niño 3.75 index (5°S-5°N, 140°W-180°W). Above average (below average) Niño 3.75 SSTs are associated with weaker (stronger) trade winds over the region 2.5°N-12.5°N, 120°E-180°E. These in turn lead to enhanced (reduced) cyclonic vorticity over the Northwest Pacific region where intense typhoons form. The TSR forecast anomaly (1965-2004) climatology) for August-September Niño 3.75 is 0.13±0.46°C (up from -0.07±0.62°C in March). The forecast skill (1965-2004) for this predictor at this lead is 57%.

## Further Information

Further information about the TSR forecasts, verifications and hindcast skill as a function of lead time may be obtained from the TSR website (<http://tropicalstormrisk.com>). The next TSR monthly forecast update for the 2005 Northwest Pacific typhoon season will be issued on the 6th June 2005. Further monthly updates will follow through to early August 2005.

## Appendix - Predictions from Previous Months

### a) Deterministic forecasts

| <b>NW Pacific ACE Index and System Numbers 2005</b> |                 |   |                    |             |                     |
|---|-----------------|---|--------------------|-------------|---------------------|
|   |                 | ACE Index<br>(x10 <sup>4</sup> knots <sup>2</sup> ) | Tropical<br>Storms | Typhoons    | Intense<br>Typhoons |
| Average Number (±SD) (1965-2004)                    |                 | 305 (±99)   | 26.7 (±4.5)        | 16.9 (±3.7) | 8.6 (±3.0)          |
| TSR Forecasts (±FE)                                 | 5th May 2005    | 314 (±80)   | 27.6 (±3.7)        | 17.5 (±2.9) | 8.9 (±2.6)          |
|   | 7th March 2005  | 340 (±92)   | 25.9 (±4.0)        | 16.1 (±3.3) | 9.8 (±2.7)          |
| Chan Forecast                                       | 27th April 2005 | -   | 24                 | 15          | -                   |

**b) Probabilistic forecasts**

| <b>NW Pacific Total ACE Index 2005</b> |                |                       |        |              |
|--|----------------|-----------------------|--------|--------------|
|  |                | Tercile Probabilities |        |              |
|  |                | below normal          | normal | above normal |
| Climatology 1965-2004                  |                | 33.3                  | 33.3   | 33.3         |
| TSR Forecasts                          | 5th May 2005   | 19                    | 51     | 30           |
|  | 7th March 2005 | 15                    | 43     | 42           |

