



# Extended Range Forecast for Northwest Pacific Typhoon Activity in 2004

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## Forecast Summary

**TSR anticipates the 2004 Northwest Pacific typhoon season will see activity close to average.**

The TSR (Tropical Storm Risk) consortium presents their extended range forecast for Northwest Pacific typhoon activity in 2004. The forecast spans the full Northwest Pacific season from 1st January to 31st December 2004 (95% of typhoons historically occur after 1st May) and is based on data available through the end of February 2004. TSR anticipates that activity will be either average or above average to 79% probability. TSR's main predictor is the forecast anomaly in August-September Niño 4 sea surface temperature (SST) which we anticipate will be  $0.09 \pm 0.29^\circ\text{C}$  warmer than normal this summer. Monthly updated forecasts will be issued through to early August.

## NW Pacific ACE Index and System Numbers in 2004

		ACE Index	Intense Typhoons	Typhoons	Tropical Storms
TSR Forecast ( $\pm$ FE)	2004	309 ( $\pm$ 91)	9.0 ( $\pm$ 2.6)	16.9 ( $\pm$ 4.1)	26.4 ( $\pm$ 5.1)
34yr Climate Norm ( $\pm$ SD)	1970-2003	292 ( $\pm$ 95)	8.4 ( $\pm$ 3.1)	16.9 ( $\pm$ 3.9)	26.9 ( $\pm$ 4.4)
Forecast Skill at this Lead	1989-2003	32%	26%	19%	10%

- 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 1994-2003  
 Forecast Skill = Percentage Improvement over Running 10-year Prior Climate Norm from Simulated Real Time Forecasts 1989-2003  
 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 41% probability that the 2004 Northwest Pacific typhoon season ACE index will be above average (defined as an ACE index value in the upper tercile historically (>331)), a 38% likelihood it will be near-normal (defined as an ACE index value in the middle tercile historically (237 to 331) and a 21% chance it will be below-normal (defined as an ACE index value in the lower tercile historically (<237)). The 34-year period 1970-2003 is used for climatology.

## Key Predictor for 2004

The key factor behind our forecast for an average Northwest Pacific typhoon season in 2004 is the anticipated near neutral Niño 4 (150°W-160°E, 5°S-5°N) SST. Above average (below average) Niño 4 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 and typhoons form. The TSR forecast anomaly (1974-2003 climatology) for August-September 2004 Niño 4 SST is  $0.09 \pm 0.29^{\circ}\text{C}$ . Forecast skill for this predictor at this lead is 44% (assessed using replicated real-time forecasts over the last 15 years).

## Forecasts and New Developments for 2004

For the 2004 Northwest Pacific typhoon season, TSR will be: (1) Issuing monthly updated deterministic forecasts through to early August for basin tropical storm, typhoon and intense typhoon numbers and for the basin ACE index. The latter reflects a combination of intensity and duration for all storms each season and may be linked more closely to total losses and disruption than the individual number of tropical storms, typhoons or even intense typhoons; (2) Issuing tercile probabilistic forecasts for the Northwest Pacific ACE index; (3) Using a new multi-ensemble statistical model for predicting the Niño 4 index; (4) Providing real-time forecasts through the TSR Storm Tracker for active Northwest Pacific storm systems. These forecasts are updated every 6-12 hours and provide the best available information on storm strength, track and track uncertainty all with various levels of zoom. Current and forecast 2-dimensional windfields are available for systems of at least typhoon force.

## Further Information

Further information on the TSR forecast methodology, the TSR simulated real-time forecast skill 1988-2002 as a function of lead time, and on TSR in general, may be obtained from the TSR website (<http://tropicalstormrisk.com>). The TSR next monthly forecast update for the 2004 Northwest Pacific typhoon season will be issued on the 5th April 2004. Further monthly updates will follow through to early August 2004.

## Appendix - Predictions from Previous Months

NW Pacific ACE Index and System Numbers 2004					
		ACE Index	Tropical Storms	Typhoons	Intense Typhoons
Average Number ( $\pm$ SD) (1970-2003)		292 ( $\pm$ 95)	26.9 ( $\pm$ 4.4)	16.9 ( $\pm$ 3.9)	8.4 ( $\pm$ 3.1)
TSR Forecast ( $\pm$ FE)	9th March 2004	309 ( $\pm$ 91)	26.4 ( $\pm$ 5.1)	16.9 ( $\pm$ 4.1)	9.0 ( $\pm$ 2.6)

