



# May Forecast Update for Northwest Pacific Typhoon Activity in 2012

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## Forecast Summary

**TSR slightly raises its forecast and anticipates the 2012 Northwest Pacific typhoon season will see activity close to the 1965-2011 climate norm.**

The TSR (Tropical Storm Risk) May forecast update for Northwest Pacific typhoon activity in 2012 anticipates a season with near-average activity. The forecast spans the full Northwest Pacific season from 1<sup>st</sup> January to 31<sup>st</sup> December 2012 (95% of typhoons occur historically after 1<sup>st</sup> May) and is based on data available through to the end of April 2012. The forecast includes deterministic and probabilistic projections for overall basin activity, and deterministic projections for the ACE index and numbers of intense typhoons, typhoons and tropical storms. TSR's main predictor at this lead for overall activity is the forecast anomaly in August-September 2012 Niño 3.75 sea surface temperature (SST). We anticipate this will be  $0.02 \pm 0.51^\circ\text{C}$  warmer than normal. Updated forecasts will be issued in early July and early August. The TSR forecast has increased slightly since early April due to a different forecast model being used from early May.

## NW Pacific ACE Index and System Numbers in 2012

		ACE Index	Intense Typhoons	Typhoons	Tropical Storms
TSR Forecast ( $\pm$ FE)	2012	300 ( $\pm$ 88)	8.5 ( $\pm$ 2.6)	15.6 ( $\pm$ 3.5)	25.5 ( $\pm$ 4.6)
47yr Climate Norm ( $\pm$ SD)	1965-2011	295 ( $\pm$ 106)	8.4 ( $\pm$ 3.0)	16.3 ( $\pm$ 3.8)	26.2 ( $\pm$ 4.6)
Forecast Skill at this Lead	1965-2011	31%	24%	15%	2%

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 Winds > 33Kts.

SD = Standard Deviation.

FE (Forecast Error) = Standard Deviation of Errors in Cross-Validated Hindcasts 1965-2011.

Forecast Skill = Percentage Improvement in Mean Square Error Afforded by Cross-Validated Hindcasts 1965-2011 over Hindcasts Made with the 1965-2011 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 34% probability that the 2012 NW Pacific typhoon season ACE index will be above-average (defined as an ACE index value in the upper tercile historically (>336)), a 43% likelihood it will be near-normal (defined as an ACE index value in the middle tercile historically (235 to 336) and a 23% chance it will be below-normal (defined as an ACE index value in the lower tercile historically (<235)). The 47-year period 1965-2011 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 (1965-2011).

## Predictors for 2012

The TSR predictors are as follows. Tropical storm and typhoon numbers are forecast before June using an ensemble of two models: the Niño 3 sea surface temperature (SST) from the prior September and the forecast number of intense typhoons in 2012. Intense typhoon numbers and the ACE index are forecast before May using an ensemble of two models: the February surface pressure in the central northern tropical Pacific region 10°N-20°N, 145°W-165°W and the forecast value for the August-September Niño 3.75 index (5°S-5°N, 140°W-180°W). From May intense typhoon numbers, and the ACE index are predicted from the forecast value for the August-September Niño 3.75 index. From June tropical storm and typhoon numbers are also forecast from the August-September Niño 3.75 index.

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.

## Further Information

Further information about TSR forecasts, verifications and hindcast skill as a function of lead time may be obtained from the TSR web site (<http://www.tropicalstormrisk.com>). The next TSR forecast update for the 2012 Northwest Pacific typhoon season will be issued on the 4<sup>th</sup> July 2012.

## Appendix – Predictions from Previous Months

### a) Deterministic forecast

NW Pacific ACE Index and System Numbers 2012					
		ACE Index (x10 <sup>4</sup> knots <sup>2</sup> )	Intense Typhoons	Typhoons	Tropical Storms
Average Number (±SD) (1965-2011)		295 (±106)	8.4 (±3.0)	16.3 (±3.8)	26.2 (±4.6)
TSR Forecasts (±FE)	4 May 2012	300 (±88)	8.5 (±2.6)	15.6 (±3.5)	25.5 (±4.6)
	13 Apr 2012	262 (±96)	7.3 (±2.7)	15.6 (±3.5)	25.5 (±4.6)
Shanghai Typhoon Institute	26 Apr 2012	-	-	-	22-24

### b) Probabilistic forecast

NW Pacific ACE Index 2012				
		Tercile Probabilities		
		below normal	normal	above normal
Climatology 1965-2011		33.3	33.3	33.3
TSR Forecasts	4 May 2012	23	43	34
	13 Apr 2012	40	38	22

