



# Extended Range Forecast for Northwest Pacific Typhoon Activity in 2012

Issued: 13<sup>th</sup> April 2012

by Dr Adam Lea and Professor Mark Saunders  
Dept. of Space and Climate Physics, UCL (University College London), UK

## Forecast Summary

**TSR anticipates the 2012 Northwest Pacific typhoon season will see activity ~10% below the 1965-2011 climate norm.**

The TSR (Tropical Storm Risk) extended range forecast for Northwest Pacific typhoon activity in 2012 anticipates a season with activity slightly below-norm. Based on current and projected climate signals, Northwest Pacific typhoon activity in 2012 is forecast to be about 10% below the 1965-2011 long-term norm. The forecast spans the period from 1<sup>st</sup> January to 31<sup>st</sup> December 2012 (95% of typhoons occur historically after 1<sup>st</sup> May). 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 predictors at this lead for overall activity are the February surface pressure in the central northern tropical Pacific (region 10-20°N, 145-165°W), and the forecast anomaly in August-September Niño 3.75 sea surface temperature (SST). Updated forecasts will be issued in early May, early July and early August.

## NW Pacific ACE Index and System Numbers in 2012

		ACE Index	Intense Typhoons	Typhoons	Tropical Storms
TSR Forecast ( $\pm$ FE)	2012	262 ( $\pm$ 96)	7.3 ( $\pm$ 2.7)	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	18%	20%	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 22% 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 38% likelihood it will be near-normal (defined as an ACE index value in the middle tercile historically (235 to 336)) and a 40% 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 May 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. From May tropical storm and typhoon numbers 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 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.

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 7<sup>th</sup> May 2012.

