



# May Forecast Update for Northwest Pacific Typhoon Activity in 2011

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## Forecast Summary

**TSR continues to anticipate the 2011 Northwest Pacific typhoon season will see activity close to average.**

The TSR (Tropical Storm Risk) May forecast update for Northwest Pacific typhoon activity in 2011 anticipates a season with near-average activity. The forecast spans the full Northwest Pacific season from 1st January to 31st December 2011 (95% of typhoons historically occur after 1st May) and is based on data available through the end of April 2011. The forecast includes deterministic and probabilistic projections for overall basin activity, and deterministic projections for the numbers of tropical storms, typhoons, intense typhoons and the ACE index. TSR's main predictor at this lead for overall activity is the forecast anomaly in August-September 2011 Niño 3.75 sea surface temperature (SST). We anticipate this will be  $0.33 \pm 0.51^\circ\text{C}$  cooler than normal. Updated outlooks for intense typhoon numbers and the ACE index will be issued in early July and early August 2011.

## NW Pacific ACE Index and System Numbers in 2011

		ACE Index	Intense Typhoons	Typhoons	Tropical Storms
TSR Forecast ( $\pm$ FE)	2011	266 ( $\pm$ 84)	7.6 ( $\pm$ 2.6)	17.7 ( $\pm$ 3.1)	28.0 ( $\pm$ 4.0)
46yr Climate Norm ( $\pm$ SD)	1965-2010	295 ( $\pm$ 100)	8.5 ( $\pm$ 3.0)	16.4 ( $\pm$ 3.8)	26.3 ( $\pm$ 4.6)
Forecast Skill at this Lead	1965-2010	28%	24%	32%	26%

- 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 1965-2010
- Forecast Skill = Percentage Reduction in Mean Square Error Afforded by Cross-Validated Hindcasts 1965-2010 over Hindcasts Made with the 1965-2010 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 20% probability that the 2011 Northwest Pacific typhoon season ACE index will be above average (defined as an ACE index value in the upper tercile historically ( $>337$ )), a 43% likelihood it will be near-normal (defined as an ACE index value in the middle tercile historically (237 to 337)) and a 37% chance it will be below-normal (defined as an ACE index value in the lower tercile historically ( $<237$ )). The 46-year period 1965-2010 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 (1965-2010).

## Key Predictors for 2011

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 2011. 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 the TSR forecasts, verifications and hindcast skill as a function of lead time may be obtained from the TSR website (<http://www.tropicalstormrisk.com>). The next TSR forecast update for the 2011 Northwest Pacific typhoon season will be issued on the 5th July 2011.

## Appendix - Predictions from Previous Months

### a) Deterministic forecasts

<b>NW Pacific ACE Index and System Numbers 2011</b>					
		ACE Index ( $\times 10^4$ knots <sup>2</sup> )	Intense Typhoons	Typhoons	Tropical Storms
Average Number ( $\pm$ SD) (1965-2010)		295 ( $\pm$ 100)	8.5 ( $\pm$ 3.0)	16.4 ( $\pm$ 3.8)	26.3 ( $\pm$ 4.6)
TSR Forecasts ( $\pm$ FE)	5th May 2011	266 ( $\pm$ 84)	7.6 ( $\pm$ 2.6)	17.7 ( $\pm$ 3.1)	28.0 ( $\pm$ 4.0)
	8th Mar 2011	275 ( $\pm$ 90)	7.8 ( $\pm$ 2.7)	17.5 ( $\pm$ 3.3)	27.8 ( $\pm$ 4.2)

### b) Probabilistic forecasts

<b>NW Pacific Total ACE Index 2011</b>				
		Tercile Probabilities		
		below normal	normal	above normal
Climatology 1965-2010		33.3	33.3	33.3
TSR Forecasts	5th May 2011	37	43	20
	8th Mar 2011	34	41	25

