July Forecast Update for Northwest Pacific Typhoon Activity in 2014

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Forecast Summary

TSR lowers its forecast but still expects the 2014 Northwest Pacific typhoon season will be the most active since 2004. TSR predicts activity will be about 10% above the 1965-2013 climate norm.

The TSR (Tropical Storm Risk) July forecast update for Northwest Pacific typhoon activity in 2014 anticipates a season with slightly above-normal activity. The forecast spans the full Northwest Pacific season from 1st January to 31st December 2014 (95% of typhoons occur historically after 1st May) and is based on data available through to the end of June 2014. 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 is the forecast anomaly in August-September 2014 Niño 3.75 sea surface temperature (SST). We anticipate this will be 0.55±0.31°C warmer than normal. The reasons for the reduction in forecast Northwest Pacific typhoon activity since early May are: 1) Niño 3.75 sea surface temperatures are expected to be cooler than thought previously, and 2) Northwest Pacific typhoon activity has been lower to date than would normally be expected for a well above-norm active season. A final forecast for Northwest Pacific typhoon activity in 2014 will be issued in early August.

NW Pacific ACE Index and System Numbers in 2014

		ACE Index	Intense Typhoons	Typhoons	Tropical Storms
TSR Forecast (±FE)	2014	335 (±89)	9 (±2)	16 (±3)	26 (±4)
49yr Climate Norm (±SD)	1965-2013	295 (±104)	8 (±3)	16 (±4)	26 (±5)
Forecast Skill at this Lead	1965-2013	26%	35%	17%	12%

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 = $x10^4$ $knots^2$.

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 1965-2013.
Forecast Skill = Percentage Improvement in Mean Square Error Afforded by Cross-Validated Hindcasts 1965-2013 over Hindcasts Made with the 1965-2013 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 51% probability that the 2014 NW Pacific typhoon season ACE index will be above-average (defined as an ACE index value in the upper tercile historically (>333)), a 37% likelihood it will be near-normal (defined as an ACE index value in the middle tercile historically (232 to 333) and only a 12% chance it will be below-normal (defined as an ACE index value in the lower tercile historically (<232)). The 49-year period 1965-2013 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 (1965-2013).

Predictors for 2014

The TSR predictors are as follows. Intense typhoon numbers and the ACE index are predicted from the forecast value for the August-September Niño 3.75 index (region 5˚S-5˚N, 140˚W-180˚W). Tropical storm and typhoon numbers are forecast 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 2014.

The key factor behind the TSR forecast for a slightly above-norm Northwest Pacific typhoon season in 2014 is the moderate positive Niño 3.75 SST anticipated in August-September 2014. Above-average (below-average) Niño 3.75 SST is 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

For more information about the TSR forecasts and their verifications for Northwest Pacific typhoon activity please see *http://www.tropicalstormrisk.com/for_typh.html*. The final TSR forecast update for the 2014 Northwest Pacific typhoon season will be issued on the 5th August 2014.

Appendix – Predictions from Previous Months

a) Deterministic forecast

NW Pacific ACE Index and System Numbers 2014					
		ACE Index ($x10^4$ knots^2)	Intense Typhoons	Typhoons	Tropical Storms
Average Number (±SD) (1965-2013)		295 (±104)	8 (±3)	16 (±4)	26 (±5)
TSR Forecasts (±FE)	3 Jul 2014	335 (±89)	9 (±2)	16 (±3)	26 (±4)
	6 May 2014	375 (±86)	11 (±3)	17 (±3)	27 (±4)
Shanghai Typhoon Institute	5 May 2014	-	-	-	26-28

b) Probabilistic forecast

NW Pacific ACE Index 2014				
		Tercile Probabilities		
		below normal	normal	above normal
Climatology 1965-2013		33.3	33.3	33.3
TSR Forecasts	3 Jul 2014	12	37	51
	6 May 2014	5	26	69