Extended Range Forecast for Northwest Pacific Typhoon Activity in 2017

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Forecast Summary

TSR predicts the 2017 Northwest Pacific typhoon season will see activity slightly above norm. However, forecast uncertainties remain large.

The TSR (Tropical Storm Risk) extended range forecast for Northwest Pacific typhoon activity in 2017 anticipates a season with upper tercile activity to moderately high (63%) probability. The forecast spans the period from 1st January to 31st December 2017 (95% of typhoons occur historically after 1st May) and employs data through to the end of April 2017. 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 for overall activity is the forecast anomaly in August-September Niño 3.75 (region 5˚S-5˚N, 140˚W-180˚W) sea surface temperature (SST) which we anticipate being 0.59±0.5°C warmer than normal (1965-2016 climatology). A warm Niño 3.75 SST would have an enhancing effect on typhoon activity. However, sizeable uncertainties remain in the ENSO forecast for August-September 2017. Updated forecasts for Northwest Pacific seasonal typhoon activity will be issued in early July and early August.

NW Pacific ACE Index and System Numbers in 2017

		ACE Index	Intense Typhoons	Typhoons	Tropical Storms
TSR Forecast (±FE)	2017	357 (±84)	10 (±3)	17 (±3)	27 (±4)
52yr Climate Norm (±SD)	1965-2016	297 (±101)	9 (±3)	16 (±4)	26 (±4)
Forecast Skill at this Lead	1965-2016	30%	28%	16%	6%

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 1965-2016.
Forecast Skill = Percentage Improvement in Mean Square Error Afforded by Cross-Validated Hindcasts 1965-2016 over Hindcasts Made with the 1965-2016 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 63% probability that the 2017 NW Pacific typhoon season ACE index will be above-average (defined as an ACE index value in the upper tercile historically (>328)), a 28% likelihood it will be near-normal (defined as an ACE index value in the middle tercile historically (243 to 328) and a 9% chance it will be below-normal (defined as an ACE index value in the lower tercile historically (<243)). The 52-year period 1965-2016 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 (1965-2016).

Predictors for 2017

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. Tropical storm and typhoon numbers are forecast using an ensemble of two models: the Niño 3 SST from the prior September and the forecast number of intense typhoons in 2017.

The main factor behind the TSR forecast for an above-normal Northwest Pacific typhoon season in 2017 is the positive Niño 3.75 SST anomaly anticipated in August-September 2017. A positive Niño 3.75 SST is associated with weaker trade wind strength over the region 2.5°N-12.5°N, 120°E-180°E. This in turn leads to higher cyclonic vorticity over the Northwest Pacific region where intense typhoons form.

It should be stressed that sizeable uncertainties remain in the August-September ENSO forecast and thus in the seasonal typhoon forecast. The precision of TSR's typhoon outlooks issued in early May is low.

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 next TSR forecast update for the 2016 Northwest Pacific typhoon season will be issued on the 6th July 2017.

Appendix – Predictions from Previous Months

a) Deterministic forecast

NW Pacific ACE Index and System Numbers 2017		ACE Index ($x10^4$ knots^2)	Intense Typhoons	Typhoons	Tropical Storms
Average Number (±SD) (1965-2016)		297 (±101)	9 (±3)	16 (±4)	26 (±4)
TSR Forecast (±FE)	5 May 2017	357 (±84)	10 (±3)	17 (±3)	27 (±4)

b) Probabilistic forecast

NW Pacific ACE Index 2017		Tercile Probabilities		
		below normal	normal	above normal
Climatology 1965-2016		33.3	33.3	33.3
TSR Forecast	5 May 2017	9	28	63