August Forecast Update for Northwest Pacific Typhoon Activity in 2017

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Forecast Summary

TSR continues to anticipate the 2017 Northwest Pacific typhoon season will likely see activity below the 1965-2016 climate norm.

The TSR (Tropical Storm Risk) August forecast update anticipates the 2017 Northwest Pacific typhoon season will have activity 10-20% below the 1965-2015 norm. 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 July 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.

The prevailing ENSO conditions over the central and western NW Pacific show an anomalous zonal temperature gradient that increases from east to west. This temperature gradient is consistent with stronger trade windspeeds (via anomalous Walker circulation) that are linked to below norm Northwest Pacific typhoon activity. Although uncertainties remain in the ENSO outlook we anticipate that the current ENSO pattern will persist through much of the remaining NW Pacific typhoon season. The development of an El Niño during 2017 is now thought unlikely. Our prediction of a below norm typhoon season is supported by the occurrence of below-norm activity through to early August, and by the May-June-July 2017 trade wind speed for the region 2.5˚N-12.5˚N, 120˚E-180˚E being stronger than norm. The latter is moderately linked to seasonal ACE.

NW Pacific ACE Index and System Numbers in 2017

		ACE Index	Intense Typhoons	Typhoons	Tropical Storms
TSR Forecast (±FE)	2017	255 (±79)	7 (±2)	14 (±3)	26 (±4)
52yr Climate Norm (±SD)	1965-2016	297 (±101)	9 (±3)	16 (±4)	26 (±4)
Forecast Skill at this Lead	1965-2016	38%	39%	21%	7%

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 19% 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 37% likelihood it will be near-normal (defined as an ACE index value in the middle tercile historically (243 to 328) and a 44% 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 TSR forecasts are weighted by the recent prior trade wind speed over the region 2.5˚N-12.5˚N, 120˚E-180˚E and by the observed typhoon activity up to the date of forecast issue. A stronger trade wind speed (as occurred in May-June-July 2017) leads to lower cyclonic vorticity and to fewer intense typhoons over the Northwest Pacific. This outlook is consistent with the activity in historical years similar to 2017, which have had an ACE index less than 72 by the 7th August. The mean total ACE for the 24 such years is 236.

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*. This is the final TSR forecast update for the 2017 Northwest Pacific typhoon season. An extended range outlook for the 2018 Northwest Pacific typhoon season will be issued in early May 2018.

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)	8 Aug 2017	255 (±79)	7 (±2)	14 (±3)	26 (±4)
	6 July 2017	250 (±86)	7 (±2)	15 (±3)	25 (±4)
	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	8 Aug 2017	44	37	19
	6 July 2017	47	35	18
	5 May 2017	9	28	63