



August Forecast Update for Northwest Pacific Typhoon Activity in 2013

Issued: 6th August 2013

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

Forecast Summary

TSR lowers its forecast and anticipates the 2013 Northwest Pacific typhoon season will see activity about 20% below the 1965-2012 climate norm.

The TSR (Tropical Storm Risk) August forecast update for Northwest Pacific typhoon activity in 2013 anticipates a season with activity ~20% below the 1965-2012 climate norm. The forecast spans the full Northwest Pacific season from 1st January to 31st December 2013 (95% of typhoons occur historically after 1st May) and is based on data available through to the end of July 2013. 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 at this lead is the forecast anomaly in August-September 2013 Niño 3.75 sea surface temperature (SST). We anticipate this will be $0.09 \pm 0.31^\circ\text{C}$ cooler than normal. The forecast has been lowered substantially from early July values due to the unusual lack of NW Pacific typhoon activity through to early August. Current activity is about 60% below the expected year-to-date activity based on a 1981-2010 climatology (<http://policlimate.com/tropical>).

NW Pacific ACE Index and System Numbers in 2013

		ACE Index	Intense Typhoons	Typhoons	Tropical Storms
TSR Forecast (\pm FE)	2013	230 (\pm 83)	6.6 (\pm 2.4)	13.2 (\pm 3.3)	22.3 (\pm 4.2)
48yr Climate Norm (\pm SD)	1965-2012	295 (\pm 105)	8.5 (\pm 3.0)	16.3 (\pm 3.7)	26.1 (\pm 4.6)
Forecast Skill at this Lead	1965-2012	37%	34%	21%	15%

- 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 = $\times 10^4$ knots².
- 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 1965-2012.
Forecast Skill = Percentage Improvement in Mean Square Error Afforded by Cross-Validated Hindcasts 1965-2012 over Hindcasts Made with the 1965-2012 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 only a 10% probability that the 2013 NW Pacific typhoon season ACE index will be above-average (defined as an ACE index value in the upper tercile historically (>336)), a 36% likelihood it will be near-normal (defined as an ACE index value in the middle tercile historically (238 to 336) and a 54% chance it will be below-normal (defined as an ACE index value in the lower tercile historically (<238)). The 48-year period 1965-2012 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 (1965-2012).

Predictors for 2013

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 2013.

The key factor behind the TSR forecast for a below-normal Northwest Pacific typhoon season in 2013 is the unusual lack of NW Pacific typhoon activity for the year-to-date. Only two typhoons have formed in the NW Pacific so far this year. Since 1965 only five years (1970, 1975, 1995, 1998 and 2010) have had two or less typhoons form by the 6th August. In these five years the average ACE index was 198 (33% below the 1965-2012 climate norm of 295), and the average number of typhoons was 11.8 (28% below the 1965-2012 climate norm of 16.3). Thus our August forecast has been lowered to 20% below the 1965-2012 climate norm despite the expectation that neutral ENSO conditions will persist through the Northern Hemisphere summer.

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>). This is the final TSR forecast update for the 2013 Northwest Pacific typhoon season. A summary of the 2013 Northwest Pacific typhoon season and verification of the TSR seasonal forecasts will be issued in early January 2014.

Appendix – Predictions from Previous Months

a) Deterministic forecast

NW Pacific ACE Index and System Numbers 2013					
		ACE Index (x10 ⁴ knots ²)	Intense Typhoons	Typhoons	Tropical Storms
Average Number (±SD) (1965-2012)		295 (±105)	8.5 (±3.0)	16.3 (±3.7)	26.1 (±4.6)
TSR Forecasts (±FE)	6 Aug 2013	230 (±83)	6.6 (±2.4)	13.2 (±3.3)	22.3 (±4.2)
	8 Jul 2013	294 (±90)	8.4 (±2.4)	15.8 (±3.4)	25.4 (±4.3)
	7 May 2013	311 (±87)	8.9 (±3.0)	16.0 (±3.4)	25.6 (±4.2)
Shanghai Typhoon Institute	26 Jul 2013	-	-	-	22-25
	25 Apr 2013	-	-	-	22-25

b) Probabilistic forecast

NW Pacific ACE Index 2013				
		Tercile Probabilities		
		below normal	normal	above normal
Climatology 1965-2012		33.3	33.3	33.3
TSR Forecasts	6 Aug 2013	54	36	10
	8 Jul 2013	26	42	32
	7 May 2013	20	42	38