August Forecast Update for Northwest Pacific Typhoon Activity in 2010

Issued: 4th August 2010

by Dr Adam Lea and Professor Mark Saunders
Aon Benfield UCL Hazard Research Centre, UCL (University College London), UK

Forecast Summary

TSR lowers its forecast and anticipates the 2010 Northwest Pacific typhoon season will see activity 25-30% below the 1965-2009 climate norm. If verified, this forecast would place 2010 typhoon activity in the lowest 25% of years since 1965.

The TSR (Tropical Storm Risk) August forecast update for Northwest Pacific typhoon activity in 2010 anticipates a season with below-average activity. The forecast spans the full Northwest Pacific season from 1st January to 31st December 2010 (95% of typhoons historically occur after 1st May) and is based on data available through the end of July 2010. 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 2010 Niño 3.75 sea surface temperature (SST). We anticipate this will be 0.90±0.20°C cooler than normal. This cooler anticipated Niño 3.75 SST is the reason for our lowered forecast for 2010 NW Pacific typhoon activity.

NW Pacific ACE Index and System Numbers in 2010

		ACE Index	Intense Typhoons	Typhoons	Tropical Storms
TSR Forecast (±FE)	2010	217 (±78)	6.1 (±2.5)	13.4 (±3.0)	22.8 (±3.8)
45yr Climate Norm (±SD)	1965-2009	299 (±97)	8.6 (±3.0)	16.6 (±3.6)	26.6 (±4.3)
Forecast Skill at this Lead	1965-2009	35%	31%	30%	20%

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 Wind > 33Kts
SD = Standard Deviation
FE (Forecast Error) = Standard Deviation of Errors in Simulated Real Time Forecasts 1965-2009
Forecast Skill = Percentage Reduction in Mean Square Error Afforded by Cross-Validated Hindcasts 1965-2009 over Hindcasts Made with the 1965-2009 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 6% probability that the 2010 Northwest Pacific typhoon season ACE index will be above average (defined as an ACE index value in the upper tercile historically (>338)), a 33% likelihood it will be near-normal (defined as an ACE index value in the middle tercile historically (238 to 338) and a 61% chance it will be below-normal (defined as an ACE index value in the lower tercile historically (<238)). The 45-year period 1965-2009 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 (1965-2009).

Key Predictors for 2010

The TSR predictors for seasonal Northwest Pacific tropical cyclone activity are as follows. Tropical storm and typhoon numbers are forecast before May using the Niño 3 sea surface temperature (SST) from the prior September; from May they are forecast using an ensemble of two predictors: April surface pressure over the region 17.5°N-35°N, 160°E-175°W, and a regression prediction against the forecast value for the August-September Niño 3.75 index (5°S-5°N, 140°W-180°W). Intense typhoon numbers and the ACE index are forecast in March and April using the February surface pressure in the central northern tropical Pacific region 10°N-20°N, 145°W-165°W; from May they are forecast 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*). This is the final TSR monthly forecast update for the 2010 Northwest Pacific typhoon season. A summary of the 2010 Northwest Pacific typhoon season and verification of the TSR seasonal forecasts will be issued in early January 2011.

Appendix - Predictions from Previous Months

a) Deterministic forecasts

NW Pacific ACE Index and System Numbers 2010					
		ACE Index ($x10^4$ knots^2)	Intense Typhoons	Typhoons	Tropical Storms
Average Number (±SD) (1965-2009)		299 (±97)	8.6 (±3.0)	16.6 (±3.6)	26.6 (±4.3)
TSR Forecasts (±FE)	4th Aug 2010	217 (±78)	6.1 (±2.5)	13.4 (±3.0)	22.8 (±3.8)
	6th Jul 2010	236 (±83)	6.7 (±2.4)	13.6 (±3.0)	23.0 (±3.8)
	5th May 2010	321 (±80)	9.2 (±2.5)	14.6 (±3.0)	24.1 (±3.8)
	8th Mar 2010	284 (±88)	8.1 (±2.6)	14.8 (±3.3)	24.2 (±3.8)
Chan Forecast	24th Jun 2010	-	-	15	23
	26th Apr 2010	-	-	16	24

b) Probabilistic forecasts

NW Pacific Total ACE Index 2010				
		Tercile Probabilities		
		below normal	normal	above normal
Climatology 1965-2009		33.3	33.3	33.3
TSR Forecasts	4th Aug 2010	61	33	6
	6th Jul 2010	51	38	11
	5th May 2010	15	43	42
	8th Mar 2010	27	43	30