



June Forecast Update for Northwest Pacific Typhoon Activity in 2004

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

Forecast Summary

TSR revises its forecast upward and anticipates activity will be slightly above average.

The TSR (Tropical Storm Risk) June forecast update for Northwest Pacific typhoon activity in 2004 anticipates a slightly above average season. The forecast spans the full Northwest Pacific season from 1st January to 31st December 2004 (95% of typhoons historically occur after 1st May) and is based on data available through the end of May 2004. TSR anticipates that activity will lie in the average tercile historically to 40% probability. Above average activity is likely to 44% probability and below average activity has only a 16% chance of occurring. TSR's main predictor is the forecast anomaly in August-September Niño 4 sea surface temperature (SST) which we anticipate will be $0.16 \pm 0.28^\circ\text{C}$ warmer than normal this summer. This predictor influences cyclonic vorticity (the spinning up of storms) in the main typhoon formation region. Monthly updated forecasts will be issued through to early August.

NW Pacific ACE Index and System Numbers in 2004

| | | ACE Index | Intense Typhoons | Typhoons | Tropical Storms |
|-------------------------------|-----------|-----------------|---------------------|-------------------|--------------------|
| TSR Forecast (\pm FE) | 2004 | 317 (\pm 81) | 9.2 (\pm 2.3) | 17.1 (\pm 3.9) | 26.6 (\pm 4.9) |
| 34yr Climate Norm (\pm SD) | 1970-2003 | 292 (\pm 95) | 8.4 (\pm 3.1) | 16.9 (\pm 3.9) | 26.9 (\pm 4.4) |
| Forecast Skill at this Lead | 1989-2003 | 47% | 53% | 31% | 21% |

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 Wind > 33Kts
 SD = Standard Deviation
 FE (Forecast Error) = Standard Deviation of Errors in Simulated Real Time Forecasts 1994-2003
 Forecast Skill = Percentage Improvement over Running 10-year Prior Climate Norm from Simulated Real Time Forecasts 1989-2003
 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 44% probability that the 2004 Northwest Pacific typhoon season ACE index will be in the upper tercile historically (defined as an ACE index value >331), a 40% likelihood it will be in the middle tercile (defined as an ACE index value between 237 and 331) and a 16% chance it will be in the lower tercile (defined as an ACE index value <237). The 34-year period 1970-2003 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 (1970-2003).

Key Predictor for 2004

The key factor behind our forecast for a slightly above average Northwest Pacific typhoon season in 2004 is the anticipated slightly warmer than normal summer Niño 4 (150°W-160°E, 5°S-5°N) SST. Above average summer Niño 4 SSTs are associated with weaker trade winds over the region 2.5°N-12.5°N, 120°E-180°E. These in turn lead to enhanced cyclonic vorticity (i.e. more storms are spun up) over the Northwest Pacific region where intense typhoons and typhoons form. Colder than normal summer Niño 4 SSTs have the opposite effect. The TSR forecast anomaly (1974-2003 climatology) for August-September 2004 Niño 4 SST is $0.16 \pm 0.28^\circ\text{C}$ (up from $-0.02 \pm 0.33^\circ\text{C}$ last month). Forecast skill for this predictor at this lead is 69% (assessed using replicated real-time forecasts over the last 15 years).

Further Information

Further information on the TSR forecast methodology, the TSR simulated real-time forecast skill 1988-2002 as a function of lead time, and on TSR in general, may be obtained from the TSR website (<http://tropicalstormrisk.com>). The TSR next monthly forecast update for the 2004 Northwest Pacific typhoon season will be issued on the 5th July 2004. Further monthly updates will follow through to early August 2004.

Appendix - Predictions from Previous Months

| NW Pacific ACE Index and System Numbers 2004 | | | | | |
|--|-------------|-----------------|-------------------|-------------------|------------------|
| | | ACE Index | Tropical Storms | Typhoons | Intense Typhoons |
| Average Number (\pm SD) (1970-2003) | | 292 (\pm 95) | 26.9 (\pm 4.4) | 16.9 (\pm 3.9) | 8.4 (\pm 3.1) |
| TSR Forecasts (\pm FE) | 7 Jun 2004 | 317 (\pm 81) | 26.6 (\pm 4.9) | 17.1 (\pm 3.9) | 9.2 (\pm 2.3) |
| | 11 May 2004 | 296 (\pm 71) | 26.1 (\pm 4.8) | 16.6 (\pm 3.6) | 8.6 (\pm 2.1) |
| | 6 Apr 2004 | 286 (\pm 92) | 25.9 (\pm 5.1) | 16.3 (\pm 4.0) | 8.2 (\pm 2.6) |
| | 9 Mar 2004 | 309 (\pm 91) | 26.4 (\pm 5.1) | 16.9 (\pm 4.1) | 9.0 (\pm 2.6) |
| Chan Forecast | 1 May 2004 | - | 29 | 18 | - |

