



April Forecast Update for Northwest Pacific Typhoon Activity in 2004

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Forecast Summary

TSR continues to anticipate the 2004 Northwest Pacific typhoon season will see activity close to average.

The TSR (Tropical Storm Risk) April forecast update for Northwest Pacific typhoon activity in 2004 continues to anticipate an 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 March 2004. TSR anticipates that activity will lie in the average tercile historically to 39% probability. Above average and below average activity are equally likely at 31% and 30% chance respectively. TSR's main predictor is the forecast anomaly in August-September Niño 4 sea surface temperature (SST) which we anticipate will be $0.11 \pm 0.31^\circ\text{C}$ cooler than normal this summer. 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 | 286 (\pm 92) | 8.2 (\pm 2.6) | 16.3 (\pm 4.0) | 25.9 (\pm 5.1) |
| 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 | 31% | 31% | 23% | 12% |

- 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 31% probability that the 2004 Northwest Pacific typhoon season ACE index will be above average (defined as an ACE index value in the upper tercile historically (>331)), a 39% likelihood it will be near-normal (defined as an ACE index value in the middle tercile historically (237 to 331)) and a 30% chance it will be below-normal (defined as an ACE index value in the lower tercile historically (<237)). The 34-year period 1970-2003 is used for climatology.

Key Predictor for 2004

The key factor behind our forecast for an average Northwest Pacific typhoon season in 2004 is the anticipated near neutral 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 $-0.11 \pm 0.31^\circ\text{C}$ (down from 0.09 0.29°C last month). Forecast skill for this predictor at this lead is 47% (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 10th May 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) | 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) |

