



## **Effects of Intraseasonal variability of the genesis potential index on Northwest Pacific Tropical Cyclone Genesis**

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The intraseasonal variability (ISV) of the genesis potential index (GPI) and its relationship with tropical cyclone (TC) genesis over the western North Pacific (WNP) are examined for the summer (May–October) during 1982 to 2016. The distribution of GPI is separated into three sub-regions as South China Sea, western part of WNP (WWNP) and eastern part of WNP (EWNP). All three regions have a statistically significant power spectrum peak in the 10–20-day period, associated with 20-30- and 50-70-day signals in SCS and 20-30-day signal in WWNP. The ISV of GPI in the SCS is the most intense among these three regions, whereas the weakest one is in the EWNP. On average, they account for about 28% of the total variance. About 83% of TCs form when at least one ISV mode is in wet phase. We further exam spatial patterns of GPI intraseasonal oscillation through empirical orthogonal function analysis performed on the 10-90-day filtered GPI data. There are 61% of TC formations in the first three spatial modes during the typical phases with anomalous PC. The ISV of GPI can modulate the TC subseasonal genesis on both frequency and location.

Regression analysis on different time scales, which is based on either the three subregions or statistical spatial modes, is able to conclude that oscillations of GPI are associated with ISO signals from different regions: 10-20-day from WNP; 30-70-day from Indian Ocean; 20-30-day from both WNP and Indian Ocean. In the boreal summer, the northward propagation of ISO accompanied with anomalous convection and circulation influences GPI intraseasonal oscillation in the WNP, which in turn modulates the TC genesis frequency and location. Such relationship can be applied to develop extended-range forecasting of tropical cyclogenesis.