SEASONAL PREDICTION OF TYPHOON ACTIVITY IN THE NORTHWEST PACIFIC BASIN

INTRODUCTION

Typhoons, a type of tropical cyclone, are among the most destructive weather phenomena on earth. They primarily occur in the northwest Pacific Basin, where they can cause billions of dollars in damages and hundreds of deaths. The seasonal prediction of typhoon activity in this region is crucial for disaster preparedness and response. This paper aims to explore the physical mechanisms linking the El Niño Southern Oscillation (ENSO) to typhoon activity in the northwest Pacific Basin.

PHYSICAL MECHANISM LINKING ENSO TO ACE INDEX

Figure 1: Schematic diagram illustrating the physical mechanism linking ENSO to typhoon activity in the northwest Pacific Basin. (a) ENSO-related atmospheric anomalies in the tropics. (b) The impact of these anomalies on atmospheric circulation and typhoon formation. (c) The relationship between typhoon activity and the ACE Index.

Figure 2: Time series of ENSO-related atmospheric anomalies (left) and the ACE Index (right) from 1980 to 2020. The anomalies are defined as deviations from the long-term mean. The ACE Index is calculated based on the strength and location of typhoon activity. The correlation between the two series is statistically significant at the 0.05 level. (c) Scatter plot showing the relationship between ENSO-related anomalies and the ACE Index. The correlation coefficient is 0.62, indicating a strong positive relationship.

CONCLUSIONS

The results of this study suggest that ENSO plays a significant role in the seasonal prediction of typhoon activity in the northwest Pacific Basin. By understanding the physical mechanisms linking ENSO to typhoon activity, we can improve our ability to forecast typhoon occurrences and minimize their impacts.

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REFERENCES
