

Increasing strength of typhoons in the Northwest Pacific Ocean in the recent years and their influencing seasonal factors

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The threat of stronger typhoons is getting bigger in the Northwest Pacific (NWP) ocean basin as the average number of Super-Typhoons (STYs) reached its maximum of 6 per year during the recent five years (2013-2017) in the recorded history. This study analyzes the favorable seasonal environmental factors for the STYs during the recent years by incorporating the remote sensing imagery and wind vector images created using U and V wind component data. The study successfully detects a crucial role of southwest air flow and northwest cold air mass in partially strengthening the STYs of the summer and winter seasons, respectively. In addition, it finds that most of winter STYs are also partially assisted by southwest air flows and, thus, exhibit higher intensities than summer STYs. The season-wise track angle analysis reveals that winter STYs' genesis positions lie more south in latitude, causing bigger genesis and turning angles, than summer STYs. The study uncovers that all summer STYs merely take recurvature once they finish their individual maximum intensity stage. The regions in the NWP basin, supporting the conversion of typical typhoons' evolution into STYs and consequent recurvature, are also detected. The findings of the current study are important for mitigating the risk related to increasing strength of typhoons in the NWP region by identifying their favorable seasonal environmental factors.

Keywords: Northwest Pacific, Super-Typhoon, Southwest Air Flow, Cold Air Mass