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# Using the Hybrid model to simulate typhoon-induced litterfall in a subtropical forest

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**ABSTRACT:**

Typhoons are the most frequent natural disturbances in the Asia Pacific region, which can induce large amounts of litterfall returning carbon and nutrients to forest floors. A substantial amount of litterfall is decomposed by microbes releasing $CO_2$ to the atmosphere, which is a pivotal biogeochemical flux in forest ecosystems. However, the assessment of the influence of typhoons to litterfall using field sampling is labor intensive making it impractical for the large-scale monitoring. Therefore, this study attempted to estimate typhoon-induced litterfall using a dynamic global vegetation Hybrid 4.2 model. A significant curvilinear relationship ($r^2 = 0.286 - 0.735$, $p < 0.05$) was found between the *in-situ* foliage, wood and total (foliage and wood) litter amounts, and field measured daily maximum wind speeds during the months encountering the perturbations. Therefore, we ingested the correlation into the model to simulate typhoon-induced litterfall. The results showed that our model can simulate typhoon-induced litterfall well with low litter production but not the other way around. The findings may facilitate monitoring the ramifications of typhoons on forest ecosystems.

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