

Evaluation of the Sensitivity of Typhoon Pre-disaster Prevention Model According to the Application of the Type of Soil Data During Typhoon Season

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Recently, as global warming has become more serious, SST in the northwest Pacific Ocean has risen, and the frequency and intensity of typhoons affecting the Korean Peninsula have been increasing. Therefore, we are conducting research by developing a Korean typhoon pre-disaster prevention model optimized for the Korean Peninsula based on the Florida Public Hurricane Loss Model (FPHLM) model of the U.S. FDFS. This typhoon pre-disaster prevention model can predict and diagnose the maximum instantaneous wind speed (3-second GUST) and maximum damage that can occur due to strong winds accompanying the typhoon. Since natural disasters have the risk of destroying almost everything at the moment they exceed the intensity of the threshold, it is very important to accurately predict the 3-second GUST and provide reliable information on possible future damage from the perspective of prevention of strong winds accompanying typhoons. To improve the prediction accuracy of the Korean typhoon pre-disaster prevention model, it is very important to improve the reliability of the Weather Research and Forecasting (WRF) numerical model that produces the initial wind information input into the model. Therefore, to improve the accuracy of the WRF model, we perform a sensitivity analysis of the WRF model according to the type of soil data. As a result of comparative analysis of each modeling result by applying the Unified Model (UM) based Global Data Assimilation Prediction System (GDAPS) soil data and Global Forecasting System (GFS) soil data to each WRF model, the accuracy of the WRF modeling results using UM-based GDAPS soil data is better. In addition, the results of the 3-second GUST of the Korean typhoon pre-disaster prevention model, which used WRF modeling results using GDAPS soil data as input, were also found to be more accurate than those of GFS soil data. In terms of preventing damage caused by strong winds accompanied by typhoons in advance, it is thought that the use of a Korean typhoon pre-disaster prevention model with improved accuracy will play an effective role in minimizing damage from typhoons.

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