

Prediction of typhoon-induced accumulated rainfall over the Korean peninsula based on historical track and intensity database

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On the average, three to four typhoons approach to the Korean peninsula (KP) every year. The prediction of rainfall during the passages of typhoon is important for the prevention and mitigation of typhoon-induced hazards, in addition to typhoon intensity and track predictions. While the numerical skills for typhoon track and intensity predictions have been significantly improved, the accurate predictions of rainfall still remains a challenging issue. This study aims to develop a statistical model for typhoon-induced accumulated rainfall (TAR) prediction over the KP based on the historical track, intensity, and rainfall data for the KP-influence typhoons. Tracks of typhoon are obtained from the best track data archived by the RSMC Tokyo during 1977-2014. Rainfall data are from the AWS at 56 stations over the KP. The procedure of the statistical approach consists of three steps: (i) the estimation of the TAR at 56 stations for the KP-influence typhoons during 1977-2014, (ii) the selection of 10 historical typhoons (TST) similar to the track of the target typhoon, within the regions of 32-40°N and 120-138°E, using Fuzzy c-Mean clustering method, (iii) the ensemble averaging of the TAR for the selected typhoons after a bias correction using a linear regression of TAR and intensity differences between the selected and targeted typhoons. This approach allowed us to estimate the mean TAR at 56 stations with the accuracy of 52-mm RMSE for total 91 typhoons that influenced to the KP.

Key words: typhoon, rainfall prediction, statistical model, the Korean peninsula

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