

Basic Data Construction for a Typhoon Disaster Prevention Model : Monthly Characteristics of Typhoon Rusa, Maemi, Kompasu, and Bolaven

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According to a typhoon report that summarized the typhoons that had affected the Korean Peninsula for approximately 100 years since the start of weather observation in the Korean Peninsula, the number of typhoons that affected the Korean Peninsula was the highest in August, followed by July, and September. A study that analyzed the period between 1953 and 2003 revealed that the number of typhoons that affected the Korean Peninsula was 62 in August, 49 in July, and 45 in September. As shown, previous studies that analyzed the typhoons that affected the Korean Peninsula by month were primarily focused on the impact frequency. This study aims to estimate the monthly impact frequency of the typhoons that affected the Korean Peninsula as well as the maximum wind speed that accompanied the typhoons. It also aims to construct the basic data of a typhoon disaster prevention model by estimating the maximum wind speed during typhoon period using Typhoon Rusa that resulted in the highest property damage, Typhoon Maemi that recorded the maximum wind speed, Typhoon Kompasu that significantly affected the Seoul metropolitan area, and Typhoon Bolaven that recently recorded severe damages. A typhoon disaster prevention model was used to estimate the maximum wind speed of the 3-second gust that may occur, and the 700 hPa wind speed estimated through WRF(Weather Research and Forecasting) numerical simulation was used as input data.

Unlike the target period reported in the white paper on typhoons (1904–2010), this study analyzed the monthly impact frequency of the typhoons that affected the Korean Peninsula from 2002 and 2015. The result indicated that the impact frequency was the highest in August, followed by July and September. This result was the same as that of the typhoon report. An analysis by year revealed that typhoon period increased in September. The 3-second gust was found to be the highest in September, followed by August and July. When this result was analyzed in relation to the recently increasing autumn typhoons (September and October), the 3-second gust result was the highest in September, indicating disaster prevention must be emphasized. By additionally analyzing the maximum wind speed distributions of Typhoon Rusa, Maemi, Kompasu, and Bolaven, the area with the maximum wind speed varied depending on the typhoon path, and the 3-second gust was higher than 44 m/s based on the typhoon intensity classification and accounted for approximately 10%.

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Keywords: Typhoon Disaster Prevention Model, WRF, 3-Second gust

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