



## **Effect of horizontal resolution and ensemble number on the precipitation forecast in the regional ensemble forecast system of the Korea Meteorological Administration**

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Despite the progresses in numerical weather prediction (NWP), the exact prediction of the amount and location of precipitation is still a major challenge in NWP. In the precipitation forecast, the resolution of the NWP model is important. Compared to the lower resolution model, the higher resolution model can predict storm scale rainfall and depict convection structures more precisely. Another method to enhance the precipitation forecast is using the ensemble technique which considers uncertainties in the initial and predicted atmospheric states. Therefore, the NWP using the higher resolution model and the ensemble technique is expected to represent inherent uncertainties in the convective scale and thus leads better precipitation forecast.

In this study, the performance of the high resolution ensemble forecasts during the summer in 2012 is evaluated using the KMA regional ensemble prediction system. To identify which horizontal resolution and ensemble number are most skillful, the system was run with three different horizontal resolutions (1.5, 2, and 3 km) and ensemble members (8, 12, and 16). To evaluate the quantitative precipitation forecast (QPF) of the system, two heavy rainfall cases during the period were analyzed using the fraction skill score (FSS) and probability matching (PM) method. The FSS was effective to determine the horizontal resolution and number of ensemble members appropriate for the system and the PM method was effective to represent the intensity of rainfall appropriately using the ensemble forecasts.