Reproduction of Climate in the Korean Peninsula Using Dynamical Downscaling Method.

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In this study, we have reproduced fine-resolution climate of South Korea using a dynamical downscaling and a statistical correction. WRF model which has horizontal grid size of 3km is integrated as a regional climate model for the downscaling for 7 years from 2002 under the given lateral boundary conditions from NCEP/NCAR reanalysis data. The model climate produced by the regional climate model has shown systematic bias due to many reasons, such as uncertainties in initial condition and model physical parameterization processes and etc.

In the present study, the systematic bias of the regional climate model is estimated and corrected by using a statistical method in order to obtain proper model climate. It is found that underestimation or overestimation that appeared in the dynamic model output is well corrected with the aid of the correction and that not only the general special patterns of the reconstructed climate are similar to the observation but also the fine structures of the geographic climate features are reasonably depicted.

Our research illustrates that the dynamical downscaling and statistical bias correction methods used in this study can be effectively utilized for the reconstruction of regional climate of a region and for the long-term prediction and projection of climate by estimating and eliminating the model bias properly.

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Keywords: Dynamic downscaling; Numerical weather model; Regional climate model; statistical correction; WRF

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