

Changes in the Extreme Events of Temperature and Precipitation over Korea Associated with Global Warming

JAI-HO OH¹, YOUNG-MI MIN¹, SU-MIN WOO¹ and WON-TAE KWON²

¹*Dept. of Env. Atmos. Sci., Pukyong Nat'l Univ., Busan, Korea*

²*Climate Res. Lab., METRI, KMA, Seoul, Korea*

The 2001 IPCC (Intergovernmental Panel on Climate Change) report suggested that the global mean surface air temperature has been gradually increased and it has been recorded as much as 0.6°C degree by the end of twentieth century. However, this trend has not been uniform either spatially or temporally. Many previous studies are focused on changes in long-term average temperature and precipitation by the Global Circulation Models (GCMs). Another important aspect involves characteristics of daily temperature, precipitation and in particular, changes in the extreme events of the daily temperature and precipitation distribution. Therefore, the main objective of this study is to examine characteristics of daily temperature and precipitation changes over Korea associated with global warming. Particular emphasis is placed on analyzing changes in the extreme events of the daily minimum and maximum temperature and precipitation distribution.

This study investigates the changes in daily temperature and precipitation together with frequency of occurrence of extreme events over Korea. Temperature and precipitation changes associated with the global warming are investigated by regional climate model. For regional climate simulation, we used MM5 (Mesoscale Model Version 5) with 27 km horizontal resolution and 18 layer of sigma-coordinate in vertical. MM5 is nested within the output of IPCC SRES (Special Report on Emission Scenarios) A2 by the ECHAM4/HOPE-G developed at the Max Planck Institute for Meteorology (MPI) for the period of 2001-2100. Based on simulations, results show faster increase of daily minimum temperature than that of daily maximum temperature and increase in extreme precipitation events. The frequency of high percentiles in daily maximum and minimum temperature has been increased while that of low percentiles in daily maximum and minimum temperature has been decreased over Korea.

Keywords: Daily temperature; Daily precipitation; Extreme events

References

- [1] IPCC (2001) Climate Change 2001: IPCC (2001) Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on climate Change (IPCC) J. T. Houghton, Y. Ding, D. J. Griggs, M. Noguer, P. J. van der Linden and D. Xiaosu (Eds.) Cambridge University Press, UK. Pp 944.