The Variability of Simulated East Asian Summer Monsoon and Tropical Cyclone Activity in SNURCM

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The Seoul National University Regional Climate Model (SNURCM) with horizontal resolution of 60 km is used to reproduce East Asian Summer Monsoon (EASM) for continuous 30 years (1980-2009) by dynamical downscaling of the reanalysis. The model can reproduce not only the climatological precipitation and associated atmospheric circulations, but also the interannual and intraseasonal variability of the EASM system as compared with the observation and the reanalysis. The relation in variability between simulated precipitation, 200-hPa upper level jet, western North Pacific subtropical high (WNPSH), and low-level monsoon circulation also appears realistically. Although the intensity of tropical cyclones in the simulation are weaker compared to observation, the occurrence frequency of simulated tropical cyclones has a similar trend to observation. The model can well characterize the years of strong and weak tropical cyclone activity, so that the interannual variability of accumulated cyclone energy (ACE) of simulated tropical cyclones over the western North Pacific are realistically obtained. In the simulation, tropical cyclone activity significantly affects EASM by weakening WNPSH and interrupting the development of EASM at the landfall of TCs over East Asia. The simulated tracks and landfall locations of tropical cyclones are also captured due to realistic representation of WNPSH and low-level monsoon flow.