

Future Changes in Rainfall Extremes Associated with El Niño Projected by a Global 20-km Mesh Atmospheric Model

Akio KITO¹, and Hirokazu ENDO²

¹ *University of Tsukuba, Tsukuba, Japan*

² *Meteorological Research Institute, Tsukuba, Japan*

El Niño/Southern Oscillation (ENSO) will still be the most dominant year-to-year variations of the future tropical climate system. A 20-km mesh atmospheric general circulation model (MRI-AGCM3.2) is used to project future changes in rainfall extremes associated with El Niño at the end of the 21st century. Four different spatial patterns in sea surface temperature (SST) changes are used as future boundary conditions based on the CMIP5 RCP8.5 scenario. Rainfall extremes such as the maximum 5-day precipitation total (Rx5d) over the western Pacific are positively correlated to the Nino3.4 SST anomalies. It is found that Rx5d regressed to the Nino3.4 SST will increase about two times in the future compared to the present value. This implies drastic increase of risk of heavy-rainfall induced disasters under by global warming over the western Pacific countries. Uncertainty is assessed using multi-member ensemble experiments with the 60-km mesh version of the model.

Key words: future change, precipitation extremes, RCP8.5, high-resolution