

## Changes in precipitation over the Arctic projected by global atmospheric models with 20-km and 60-km grid sizes

\*Shoji Kusunoki<sup>1</sup>

1.Meteorological Research Institute

A set of global warming projections was conducted using global atmospheric models with high-horizontal resolution of 20-km (MRI-AGCM3.2S, the 20-km model) and 60-km (MRI-AGCM3.2H, the 60-km mode) grid sizes. For the present-day climate (1983-2003, 21 years), models were forced with observed historical sea surface temperatures (SST). For the future climate (2079-2099, 21 years, RCP8.5), models were forced with future SST distributions projected by the models of the Fifth phase of Couple Model Intercomparison Project (CMIP5). The uncertainty of projection was evaluated by ensemble simulations for four different SST distributions and three different cumulus convection schemes.

The annual mean precipitation (PAVE), the simple daily precipitation intensity index (SDII), and the maximum 5-day precipitation total (R5d) averaged over the Arctic increased in the end of the 21st century. The increases in PAVE, SDII, and R5d can be partly attributed to an increase in water vapor associated with increasing temperatures, and to an increase in the horizontal transport of water vapor from low to high latitudes. These results are consistent with Kusunoki et al. (2015).

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