Urban Climate Projection in 2050s and 2070s by the WRF model with 3-km Horizontal Resolution

Hiroyuki KUSAKA [1], Sachiho ADACHI[1], Masahiro UENO[1], Yoshiki YAMAGATA[2] Izuru TAKAYABU[3], Michael G. DUDA[4], Yuko AKIMOTO[1], Yuya TAKANE[1], Masayuki HARA[5], and Jimy DUDHIA[4]

1: University of Tsukuba, Tsukuba, Japan, kusaka@ccs.tsukuba.ac.jp

2: National Institute of Environmental Sciences (NIES)

3: Meteorological Research Institute, Japan (MRI)

4: National Center for Atmospheric Research, USA (NCAR)

5: Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

Regional Climate Models (RCMs) with less than 5-km resolution have been recently used to predict future climate of Japan islands in the big projects of Japan (e.g., KAKUSHIN and S-5-3). In the project S-5-3, the Weather Research and Forecasting (WRF) model is used as one of the RCMs. Some researchers have been applying the WRF model to the weather of Japan since Kusaka et al. (2005). However, as far as we know, there are no reports on the urban climate projection using the WRF model with less than 4-km horizontal resolution. In the present study, we perform future urban climate projection for the Tokyo metropolitan area in Japan. One of our new things is that the three different types of future land-use projection data set is used in the calculation of future urban climate projection.

The results of urban climate simulation and projection are very briefly summarized as follows. (1) The WRF model has almost same accuracy as that of the NHRCM for the current climate simulation, although the features of the systematic error are different from the NHRCM. (2) Regarding the future urban climate projection, it is found that the surface air temperature in the Nagoya area tends to increase larger than that of the other two areas until 2070s. More detail will be shown in the workshop.

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