

CMIP5 気候モデルにおける夏季北ユーラシアの降水再現性

廣田渚郎^{1,2}、高藪縁²、濱田篤²¹ 国立極地研究所² 東京大学大気海洋研究所**Reproducibility of summer precipitation over northern Eurasia in CMIP5 multi-climate models**Nagio Hirota¹, Yukari N. Takayabu² and Atsushi Hamada²¹ *National Institute of Polar Research*² *Atmosphere and Ocean Research Institute, The University of Tokyo*

Reproducibility of summer precipitation over northern Eurasia in the Coupled Model Intercomparison Project Phase 5 (CMIP5) climate models is evaluated in comparison with several observational and reanalysis datasets. All CMIP5 models under- and over-estimate precipitation over western and eastern Eurasia, respectively, and the reproducibility measured using the Taylor skill score is largely determined by the severity of these west–east precipitation biases. The following are the two possible causes for the precipitation biases: very little cloud cover and very strong local evaporation-precipitation coupling. The models underestimate cloud cover over Eurasia, allowing too much sunshine and leading to a warm bias at the surface. The associated cyclonic circulation biases in the lower troposphere weaken the modeled moisture transport from the Atlantic to western Eurasia and enhance the northward moisture flux along the eastern coast. Once the dry west and wet east biases appear in the models, they amplify because of stronger evaporation-precipitation coupling. The CMIP5 models reproduce precipitation events well over a time scale of several days, including the associated low-pressure systems and local convection. However, the modeled precipitation events are relatively smaller over western Eurasia and larger over eastern Eurasia compared to the observations, and these are consistent with the biases found in the seasonal average fields.

References

Hirota, N., Y. N. Takayabu, and A. Hamada, Reproducibility of summer precipitation over northern Eurasia in CMIP5 multi-climate models. *J. Climate*, in revision.