

Changes in early summer precipitation over the Northeast Asia in RCP scenarios simulated by WRF

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Dynamically downscaled early summer precipitation (May–July, MJJ) for present (1981–2010) and future (2071–2100) climates in Northeast Asia (NEA) were analyzed using a high-resolution regional climate model (WRF 3.4) based on the Representative Concentration Pathways (RCPs) induced by the global circulation model (HadGEM2-AO) (Hong and Ahn, 2015). The results of regionally downscaled Historical experiment (D_Historical) demonstrated the model's ability to capture the spatial and temporal variations of rain band migrating meridionally during MJJ over NEA. According to the regional model projection, intensive precipitation will increase and the rain band will affect the Korean Peninsula approximately 10 days earlier than the D_Historical cases in both RCP4.5 and RCP8.5. The precipitation will also increase in most of the domain, particularly in the southern Korean Peninsula and Kyushu, Japan. These increases in precipitation are attributed to increases in the northward moist transport coming from the lower latitudes and moist static instability in the lower atmosphere. According to this study, the convective precipitation contributes mainly to the increase in total precipitation. On the other hand, the large-scale non-convective precipitation related to the stationary front will not change significantly but even tend to decrease approximately from the middle of July.

Key words: summer precipitation, RCPs, Northeast Asia, future climate change

Reference

Hong, J.-Y., and J.-B. Ahn, 2015: *J. Climate*, **28**, 3557–3578.

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