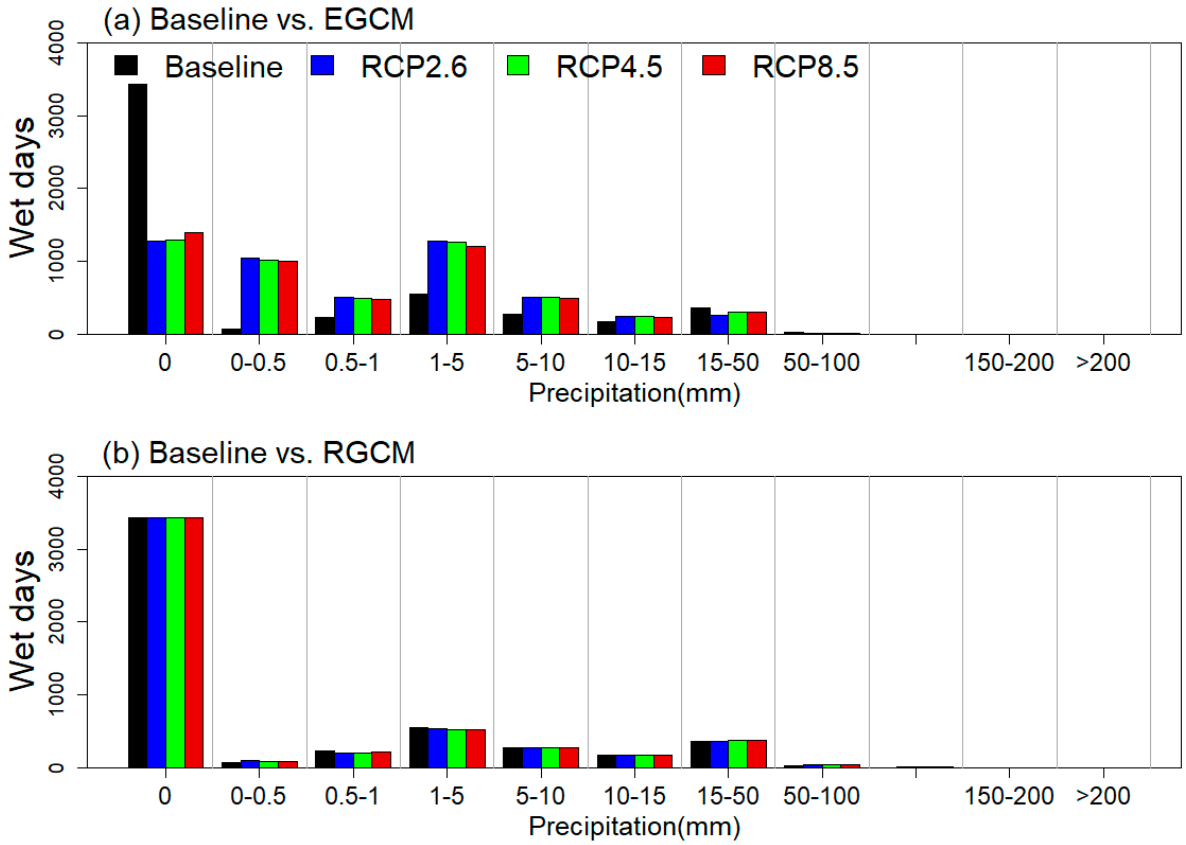


**Figure. S1.** The number of rain days of (a) EGCM and (b) RGCM at each bin for the entire period.

**Table S1.** Description of eight General Circulation Models (GCMs) used for this study

| Num. | Model | Full name | Modeling Group |
|---|---|---|---|
| 1 | BCC-CSM1-1.1 | Beijing Climate Center (BCC) -Climate System Model (CSM) | Beijing Climate Center, China Meteorological Administration |
| 2 | CCSM4.1 | Community Climate System Model (CCSM) 4.1 | National Center for Atmospheric Research |
| 3 | GFDL-ESM2G.1 | Geophysical Fluid Dynamics Laboratory (GFDL) -Earth System Model (ESM) | NOAA Geophysical Fluid Dynamics Laboratory |
| 4 | IPSL-CM5A-LR.1 | Institut Pierre-Simon Laplace (IPSL)-Climate Model(CM)5A-Low Resolution | Institut Pierre-Simon Laplace |
| 5 | IPSL-CM5A-MR.1 | Institut Pierre-Simon Laplace (IPSL)- Climate Model(CM)5A-Medium Resolution | Institut Pierre-Simon Laplace |
| 6 | MIROC-ESM-CHEM.1 | An atmospheric chemistry coupled version of Model for Interdisciplinary Research on Climate (MIROC) - Earth System Model (ESM) | Japan Agency for Marine-Earth Science and Technology, Atmosphere and Ocean Research Institute (The University of Tokyo), and National Institute for Environmental Studies |
| 7 | MIROC5.1 | Model for Interdisciplinary Research on Climate (MIROC) | Atmosphere and Ocean Research Institute (The University of Tokyo), National Institute for Environmental Studies, and Japan Agency for Marine-Earth Science and Technology |
| 8 | NorESM1-M | Norwegian Earth System Model (NorESM) | Norwegian Climate Centre |

$$\lambda E = \frac{\Delta \cdot (H_{net} - G) + \rho_{air} \cdot c_p \cdot [e_z^o - e_z]/r_a}{\Delta + \gamma \cdot (1 + r_c/r_a)} \quad \text{(S1)}$$

Where $\lambda E$ is the latent heat flux density (MJ/m²·d), $E$ is the depth rate evaporation (mm/d), $\Delta$ is the slope of the saturation vapor pressure-temperature (kPa/°C), $H_{net}$ is the net radiation (MJ/m²·d), $G$ is the heat flux density to the ground (MJ/m2*d), $\rho_{air}$ is the air density (kg/m³), $c_p$ is the specific heat at constant pressure (MJ/kg/°C), $e_z^o$ is the saturation vapor pressure of air at height $z$ (kPa), $e_z$ is the water vapor pressure of air at height z (kPa), $\gamma$ is the psychrometric constant (kPa/°C), $r_c$ is the plant canopy resistance (s/m), and $r_a$ is the diffusion resistance of the air layer (aerodynamic resistance) (s/m).